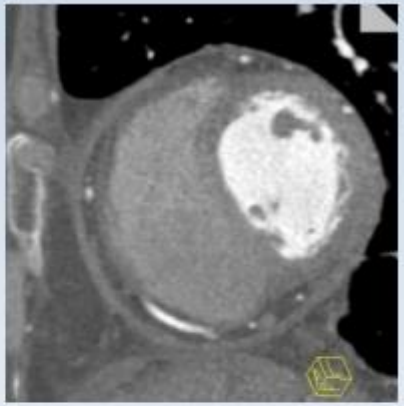
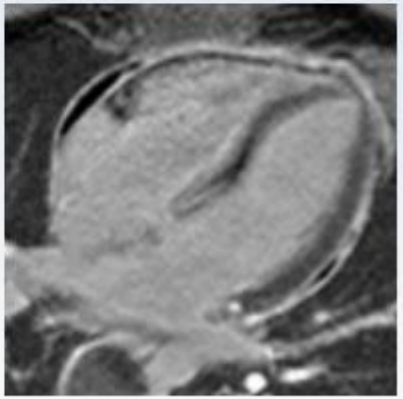
Péricarde : Quoi de neuf ?

P Meurin. Les Grands Prés

Highlights: New 2015

- Colchicine Class IA recommendation (always with ASA or NSAIDs)
- Immunosuppressants / Pericardectomy for refractory pericarditis
- Role of Imaging
- Medical treatment option in some cases of constriction
- Exercise restriction





Péricardite aigue

- Qui hospitaliser et pourquoi ?
- Quel traitement ?
- Quel bilan ?

ACUTE PERICARDITIS
Diagnostic criteria

Pericarditis	Definition and diagnostic criteria
Acute	Inflammatory pericardial syndrome to be diagnosed with at least 2 of the **4 following criteria:** (1) pericarditic chest pain (2) pericardial rubs (3) new widespread ST-elevation or PR depression on ECG (4) pericardial effusion (new or worsening) **Additional supporting findings:** - Elevation of markers of inflammation (i.e. C-reactive protein, erythrocyte sedimentation rate, and white blood cell count); - **Evidence of pericardial inflammation by an imaging (CT, CMR).**
Incessant	Pericarditis lasting for >4–6 weeks but <3 months[a] without remission.
Recurrent	Recurrence of pericarditis after a documented first episode of acute pericarditis and a symptom-free interval of 4–6 weeks or longer[a].
Chronic	Pericarditis lasting for >3 months.

CMR = cardiac magnetic resonance; CT = computed tomography; ECG = electrocardiogram.
[a]Usually within 18-24 months but a precise upper limit of time has not been established.

*Circulation 2007;**115**:2739–2744. - N Engl J Med 2013;**369**:1522–1528.*
*Lancet 2014;S0140–6736: 62709–9. - JAMA 2014;**312**:1016–1023*
*J Am Soc Echocardiogr 2013;**26**:965–1012.e15 - Eur Heart J Cardiovasc Imaging 2014;**16**:12–31*

European Heart Journal (2015) - doi:10.1093/eurheartj/ehv318

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Qui hospitaliser et pourquoi ?
Rechercher facteurs péjoratifs prédisant une évolution favorable et/ou étiologie inhabituelle

- Fièvre (> 38°c)
- Epanchement abondant ou tamponnade
- Présentation subaiguë
- Résistance au traitement > 7 jours
- Facteurs accessoires

High risk patients

Certain clinical features at presentation may be associated with an increased risk of specific aetiologies (nonviral or nonidiopathic) and/or complications during follow-up (recurrences, tamponade, constriction).

Major (according to multivariate analysis):

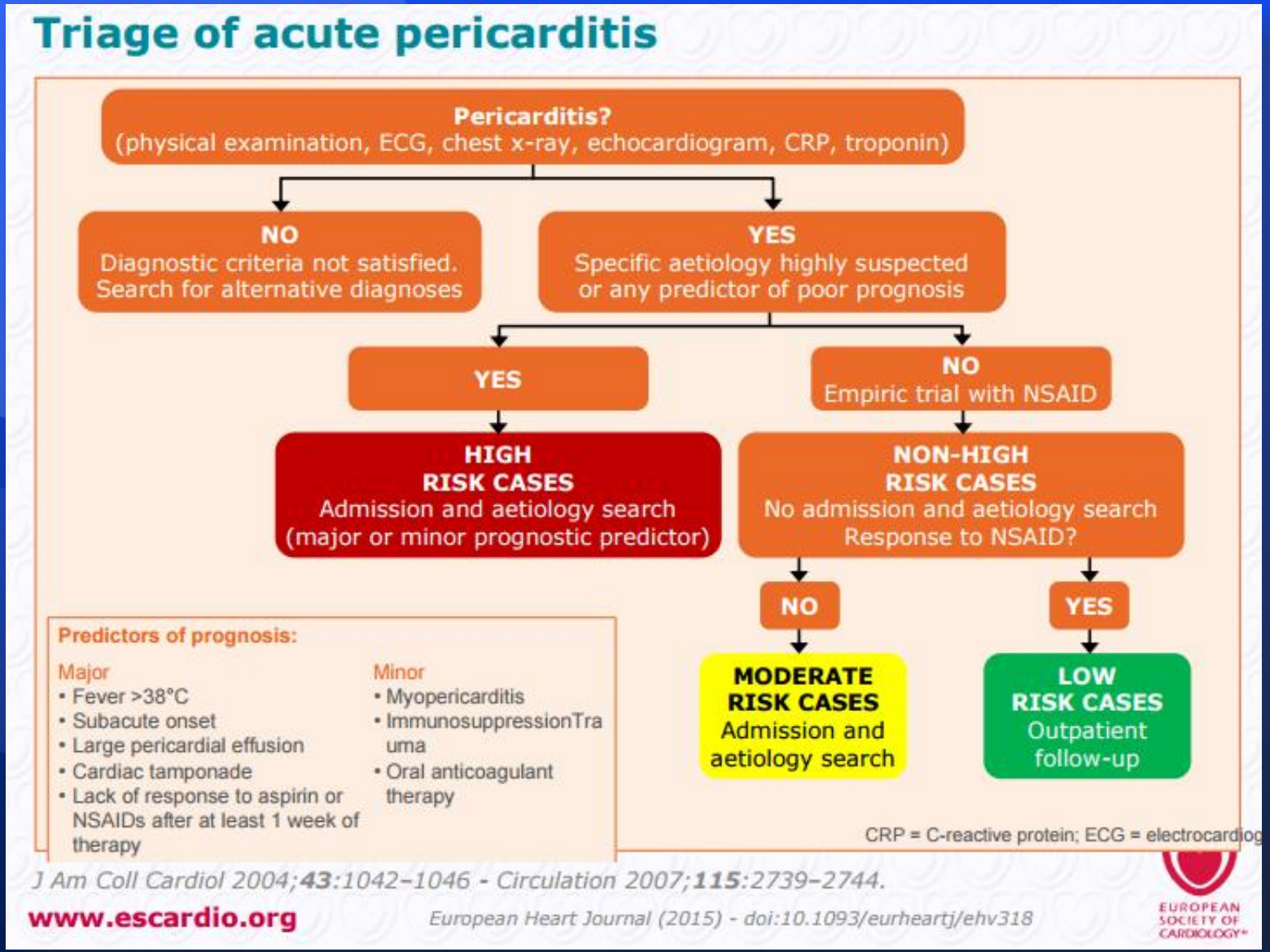
- Fever >38°C,
- Subacute onset,
- **Large pericardial effusion (>20 mm on echocardiography),** ← Echo
- **Cardiac tamponade,**
- Lack of response to aspirin or NSAID after at least 1 week of therapy.

Minor (according to literature review and expert opinion):

- Pericarditis associated with myocarditis,
- Immunodepression,
- Trauma,
- Oral anticoagulant therapy.

*J Am Coll Cardiol 2004;**43**:1042–1046 - Circulation 2007;**115**:2739–2744.*

Qui hospitaliser ?



Quel traitement ?

Bithérapie systématique

Molécule	Dose quotidienne	Durée	Modalités d'arrêt
AINS : **- Aspirine** **Ou** **- Ibuprofène**	750 à 1000 mg x 3 600 mg x 3	1 à 2 semaines à pleine dose (dose un peu plus faible : 1 à 2 g par jour chez le coronarien) 1 à 2 semaines à pleine dose	Progressif en 1 à 2 mois Progressif en 1 à 2 mois
Colchicine	0.5 mg une (< 70 kg) ou 2 (≥ 70 kg) 2 fois par jour	3 mois	D'un coup ou 0,5 mg un jour sur 2 la dernière semaine
Arrêt de l'exercice physique	Jusqu'à disparition des symptômes, normalisation ECG, écho et CRP. au moins 3 mois chez l'athlète.		

Exercise Restriction

Recommendations for the treatment of acute pericarditis

Recommendations for the management of recurrent pericarditis

Recommendations	Class[a]	Level[b]	Ref.[c]
Exercise restriction should be considered for non-athletes with acute pericarditis until resolution of symptoms and normalization of CRP, ECG and echocardiogram	IIa	C	
For athletes, the duration of exercise restriction should be considered until resolution of symptoms and normalization of CRP, ECG and echocardiogram—at least 3 months is recommended	IIa	C	

Recommendations for the diagnosis and management of pericarditis associated with myocarditis

Rest and avoidance of physical activity beyond normal sedentary activities is recommended in non-athletes and athletes with myopericarditis for a period of 6 months	I	C	

Place des corticoïdes

- **Première ligne ≈ Jamais**

  Si CI à AINS/aspirine

- **Deuxième ligne : en trithérapie**

  Echec de la bithérapie

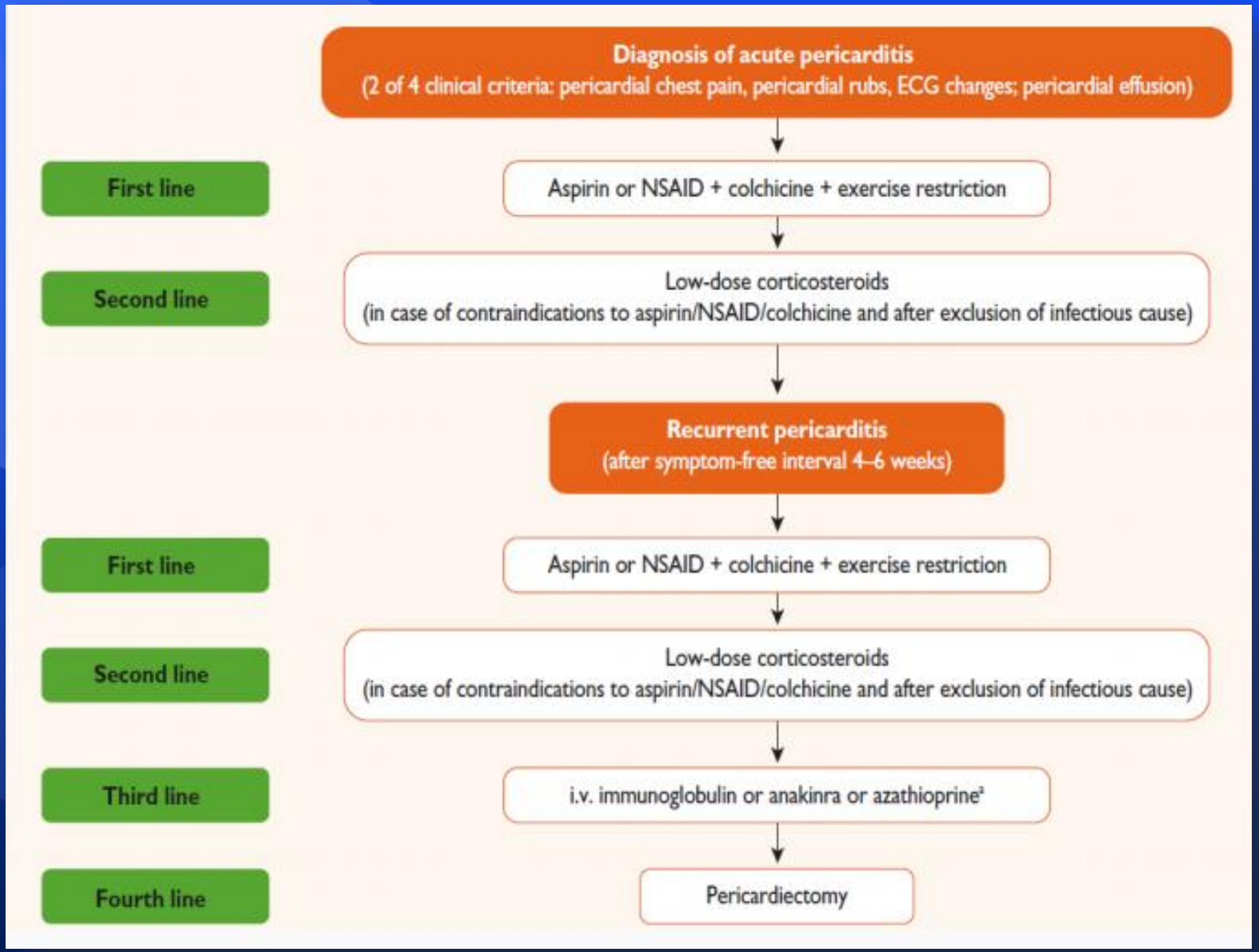
- **Modalités pratiques :**

  Dose faibles : 0,2 à 0,5 mg/kg prednisone

  - Jusqu'à disparition des symptômes et normalisation de la CRP

  - Puis réduction lente +++ guidée par symptômes/CRP

  En dessous de 15 mg, baisse de 1,25 à 2,5 mg toutes les 2 à 6 semaines


Diagnosis of acute pericarditis
(2 of 4 clinical criteria: pericardial chest pain, pericardial rubs, ECG changes; pericardial effusion)
First line
Aspirin or NSAID + colchicine + exercise restriction
Second line
Low-dose corticosteroids
(in case of contraindications to aspirin/NSAID/colchicine and after exclusion of infectious cause)
Recurrent pericarditis
(after symptom-free interval 4–6 weeks)
First line
Aspirin or NSAID + colchicine + exercise restriction
Second line
Low-dose corticosteroids
(in case of contraindications to aspirin/NSAID/colchicine and after exclusion of infectious cause)
Third line
i.v. immunoglobulin or anakinra or azathioprine[3]
Fourth line
Pericardiectomy

Quel bilan ?

Diagnostic positif et différentiel

- ECG
- Echo
- Rx Thorax
- CRP
- TSH
- ± BHC, HIV, HCV
- Troponine, CPK
- NFS-pq et iono-créat)

Diagnostic étiologique : aucune recherche (sauf HIV et HCV) si pas de facteur péjoratif

- **Ne pas passer à côté des péricardites avec une cause dont le diagnostic est utile :**
  - **Tuberculose : 5 %**
  - **Maladie Auto-immune : 5 %**
  - **Cancer : 5 %**
- **Mais ces 3 causes ont le plus souvent des présentations particulières :**
  - **Epanchement**
  - **Evolution subaiguë**
  - **Résistance au traitement.....**

First and second level investigations for pericarditis

Level	Investigation
1st level (all cases)	Markers of inflammation (i.e. ESR, CRP, white blood cell count). Renal function and liver tests, thyroid function. Markers of myocardial lesion (i.e. troponins, CK). ECG, **Echocardiography,** Chest X-ray.
2nd level (if 1st level not sufficient for diagnostic purposes)	**CT and/or CMR,** Analysis of pericardial fluid from pericardiocentesis, or surgical drainage, for cardiac tamponade or suspected bacterial, neoplastic pericarditis, or symptomatic moderate to large effusions not responding to conventional anti-inflammatory therapy. Additional testing should be directed to specific aetiologies according to clinical presentation (presence of high risk clinical criteria).

CK = Creatine Kinase; CMR = cardiac magnetic resonance; CRP = C-reactive protein; ECG = electrocardiogram; ESR = erythrocyte sedimentation rate.

European Heart Journal (2015) - doi:10.1093/eurheartj/ehv318

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Une nouvelle entité

La péricardite constrictive transitoire

Constrictive Pericarditis

Therapy

Recommendations	Class	Level
The mainstay of treatment of chronic permanent constriction is pericardiectomy.	I	C
Medical therapy of specific pericarditis (i.e. tuberculous pericarditis) is recommended to prevent the progression of constriction.	I	C
Empiric anti-inflammatory therapy may be considered in cases with transient or new diagnosis of constriction with concomitant evidence of pericardial inflammation (i.e. CRP elevation or pericardial enhancement on CT/CMR).	IIb	C

CMR = cardiac magnetic resonance; CRP = C-reactive protein; CT = computed tomography.

If evidence of Pericarditis Treat with Anti-Inflammatory Tx

European Heart Journal (2015) - doi:10.1093/eurheartj/ehv318

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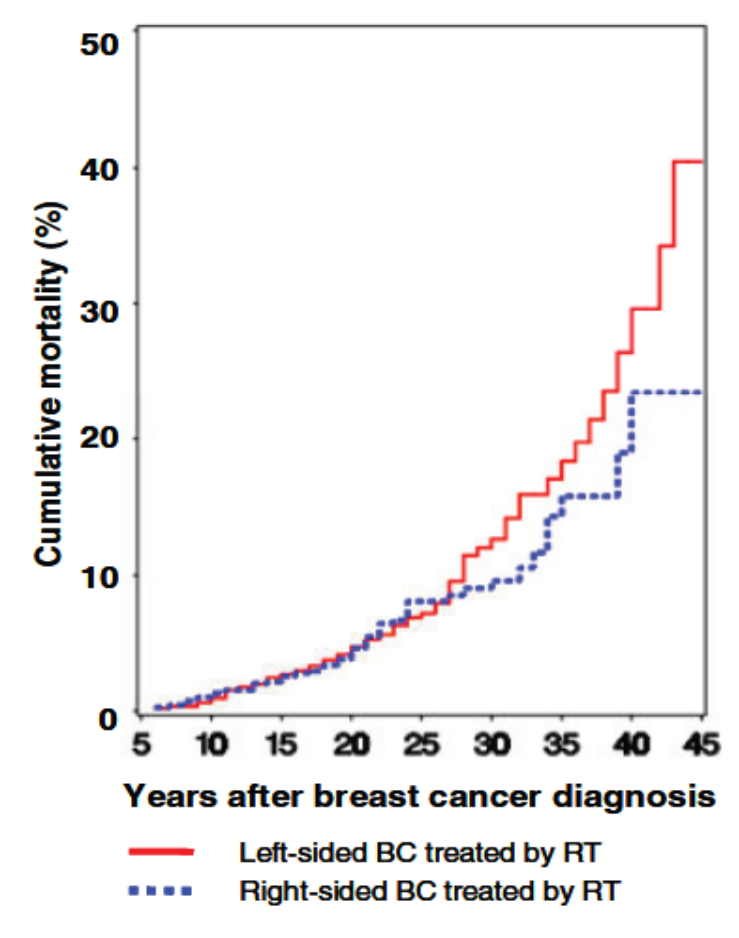
Complications péricardiques de la radiothérapie

Complications cardiaques de la radiothérapie

- **Péricardiques**
  - **Péricardite aiguë précoce (per RXT) ou tardive**
  - **Tamponnade précoce ou tardive**
  - **Epanchement péricardique**
  - **Constriction : 1-3 % à 20 ans**
- **Myocardiques**
  Pancardite, cardiomyopathie (chimio)
- **Coronaires : 10 % à 20 ans**
- **Valvulaires : 5 % à 20 ans**
- **Rythme/Conduction**

Après cancer du sein



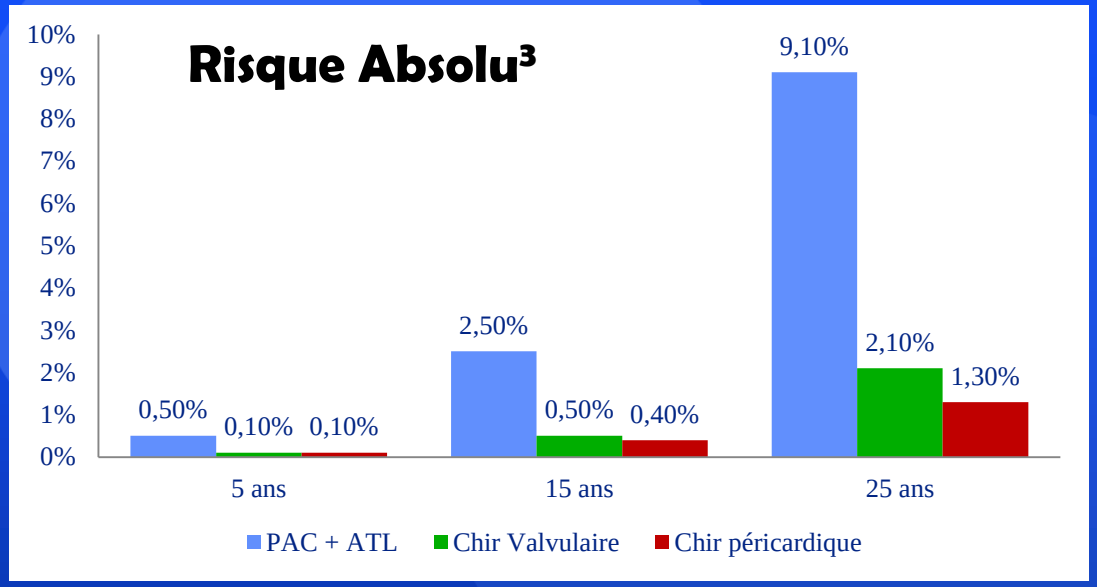
Femmes survivant plus de 5 ans après un cancer du sein ;
Suivi moyen de 28 ans :

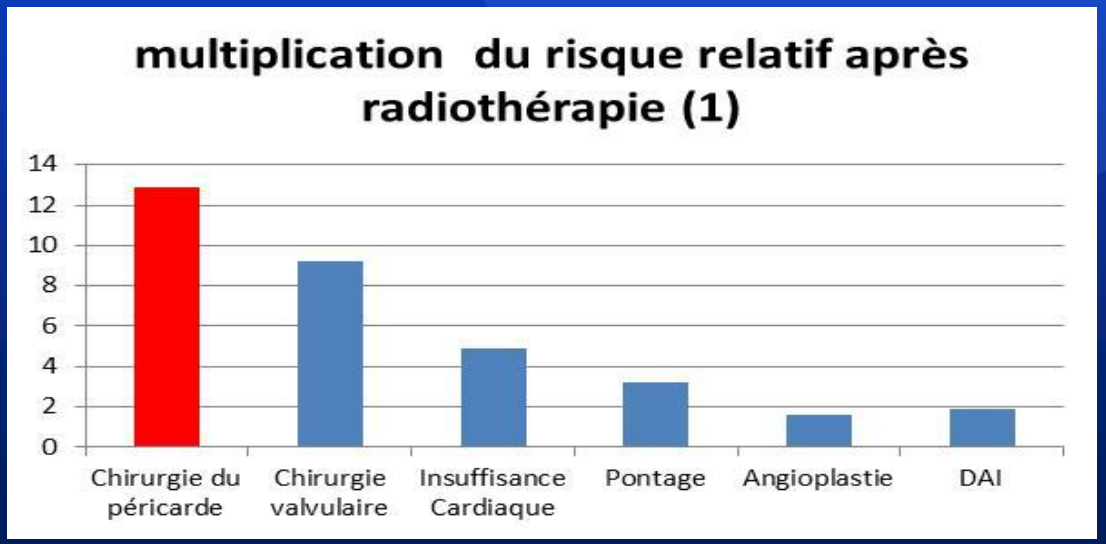
- **Mortalité Cv x 1,76 si radiothérapie**
- **Droite/gauche**

  Mortalité cv x 1,56 à G/D

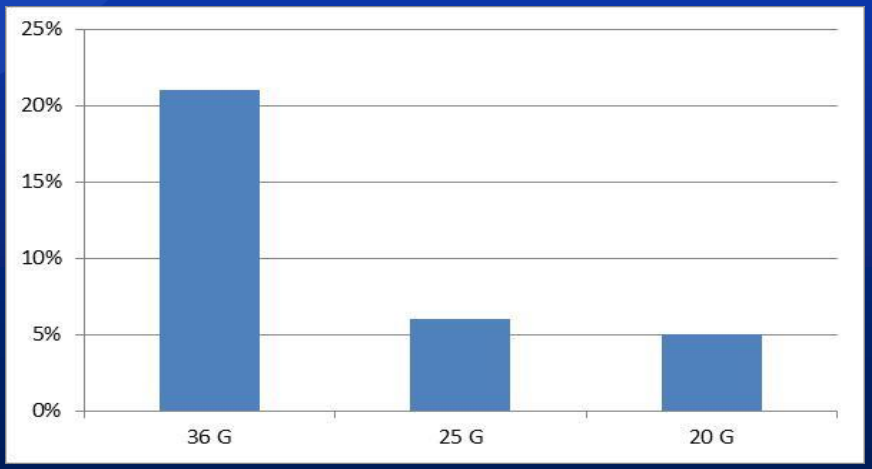
Bouillon K et al . J Am Coll Cardiol 2011;57:445-52.

Après hodgkin





Incidence cumulative des maladies cardiaques 25 ans après radiothérapie thoracique en fonction de la dose (2)



1- Jaworski et al. J Am Coll Cardiol. 23. Cardiac Complications of Thoracic Irradiation,2013:2319–28 ; 2- Schellong G, et al. Pediatr Blood Cancer 2010;55:1145–52;
3- Galper S et al. Blood 2011;412-8

Facteurs de risque de cardiotoxicité de la radiothérapie

- Dose Totale > 30-35 Gy
- Fractionnement > 2 Gy / 24h
- Volume de cœur irradié (champ)
- Tumeur proche du cœur
- Type de RX (cobalt)
- Chimiothérapie associée (anthracyclines)
- Fdr classiques (tabac...)

Péricardite aigue

- Rares aujourd'hui car précautions
  Protection cardiaque, calculs de doses...
- Présentation clinique classique
- Traitement à priori classique
- Pas d'interruption de la radiothérapie

Bithérapie systématique

Molécule	Dose quotidienne	Durée	Modalités d'arrêt
AINS : **- Aspirine** **Ou** **- Ibuprofène**	750 à 1000 mg x 3 600 mg x 3	1 à 2 semaines à pleine dose (dose un peu plus faible : 1 à 2 g par jour chez le coronarien) 1 à 2 semaines à pleine dose	Progressif en 1 à 2 mois Progressif en 1 à 2 mois
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Arrêt de l'exercice physique	Jusqu'à disparition des symptômes, normalisation ECG, écho et CRP. au moins 3 mois chez l'athlète.		

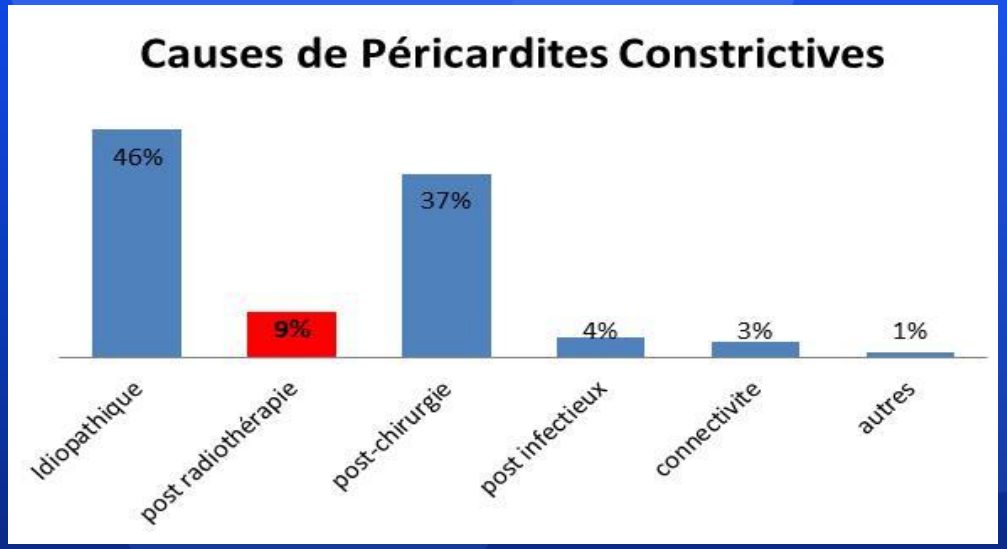
Péricardite constrictive

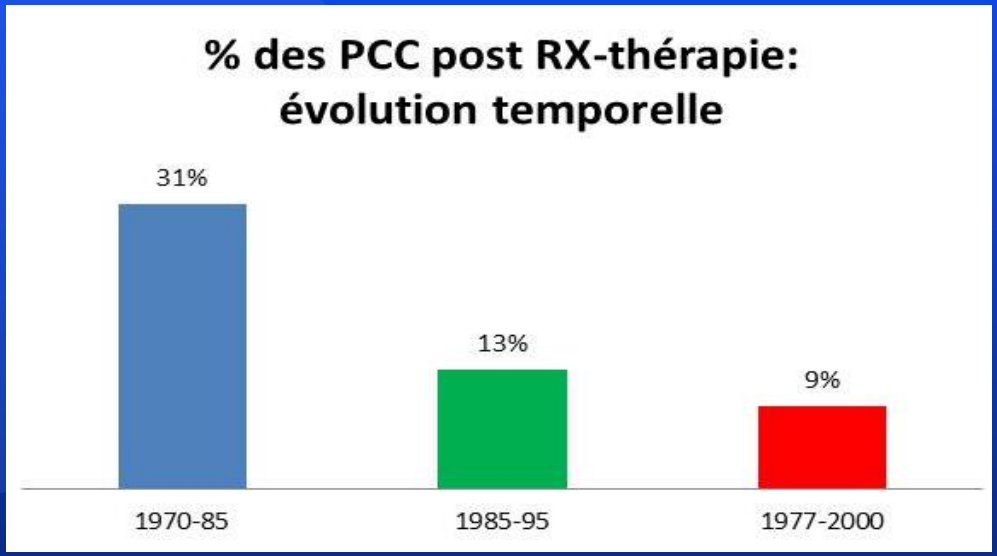
Différents types de constrictions péricardiques

Syndrome	Définition	Traitement
Constriction transitoire	Péricardite Constrictive inflammatoire réversible	2-3 mois de TT anti-inflammatoire empirique
Epanchement péricardique constrictif	Absence de baisse de la POD après drainage	Drainage puis traitement anti-inflammatoire puis péricardectomie si nécessaire
Péricardite Constrictive Chronique	Constriction persistant plus de 3 à 6 mois	péricardectomie

Imazio M et al. J Cardiovasc Med 2010;11:712-22. ESC Guidelines 2015

PCC post-radiothérapies : incidence en diminution ?





1- Bertog SC. J Am Coll Cardiol 2004;1445-52. 2-Cameron J et al. Am heart J 1987;113 (2pt1):354-80. 3-Ling LH et al.Circulation 1999;100:1380-6

Péricardite chronique constrictive

TDM :

- Recherche des calcifications péricardiques (reconstructions 3D au bilan préopératoire)
- Recherche de signes de constriction (analyse de la cinétique)
- Le bilan des coronaires (préopératoire)
- Analyse des structures intra-thoraciques

IRM :

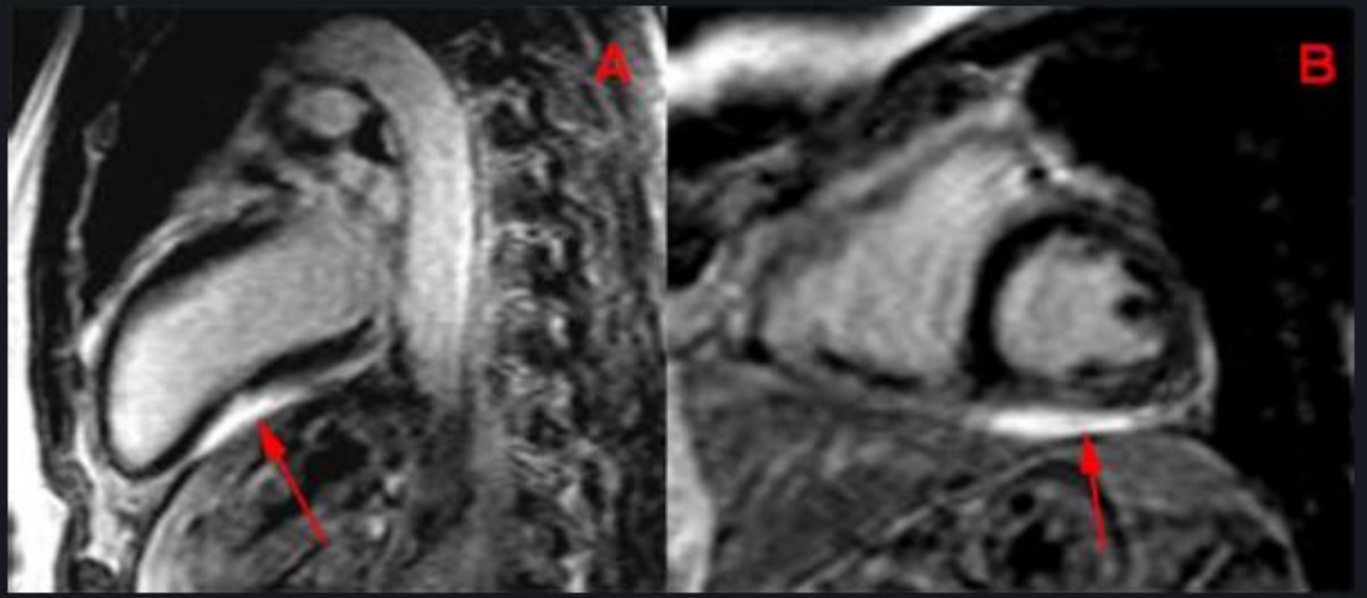
- Analyse de la cinétique septale (PC vs CMR)
- Recherche de signes d' inflammation, de zones de fibrose et d' atrophie myocardique (CI de la chirurgie)

Péricardite chronique constrictive

Anomalies dynamiques : IRM

Péricardite chronique constrictive

Le rehaussement tardif du péricarde en IRM



Suivi systématique du patient asymptomatique après radiothérapie ?

- **Bilan pré Rxπι**
  - **Fdr, écho…**
- **5 ans après la fin du traitement puis tous les ans**
  - **Examen et interrogatoire**
- **Autres :**
  - **ECG ? Echo ? BNP ? Holter ? Score calcique ? IRM ? …**

Imagerie multimodale

Multimodality imaging

A modern approach for the management of pericardial diseases should include the integration of different imaging modalities in order to improve the diagnostic accuracy and clinical management of patients.

	TTE	CT	CMR
Technical aspects			
Availability	+++	++	+
Cost	Low	Moderate	High
Exam duration (minutes)	15-30	10	30-40
Safety	+++	+	++
Pt access and monitoring	+++	++	+/-
Pericardium			
Pericardial thickness	+/-	+++	+++
Pericardial calcifications	+	+++	-
Pericardial inflammation	+/-	++	+++
Motion layers (adhesions)	++	+	+++
Effusion detection	++	+++	+++

	TTE	CT	CMR
Pericardium *(cdt)*			
Effusion characterization	+	++	++
Pericardial masses	+	+/++	++/+++
Guiding/monitoring pericardiocentesis	+++	-	-
Cardiac morphology			
(Including tissue characterization)	++	++	+++
Cardiac function			
Systolic	+++	++	+++
Diastolic function	+++	-	++
Septal motion (coupling)	+++	+/-	+++
Respiratory changes	++	+/-	++

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Epanchements péricardiques post-opératoires : vision des non-chirurgiens

Études POPEYE, POPE, POPE 2

Equipe des Grands Prés :
P. Meurin, H. Weber, R. Dumaine,
N. Renaud, A. Grosdemouge, C. Defrance, A. Bendriss,
JY. Tabet

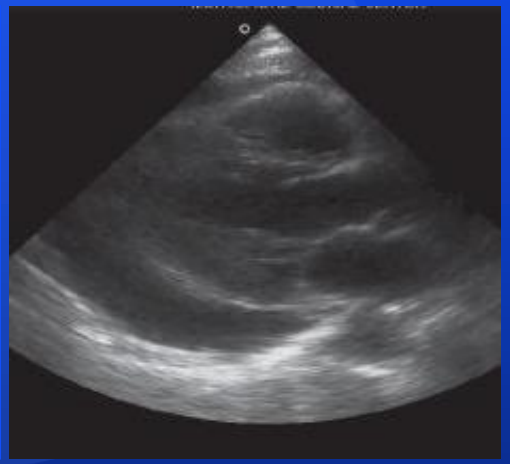
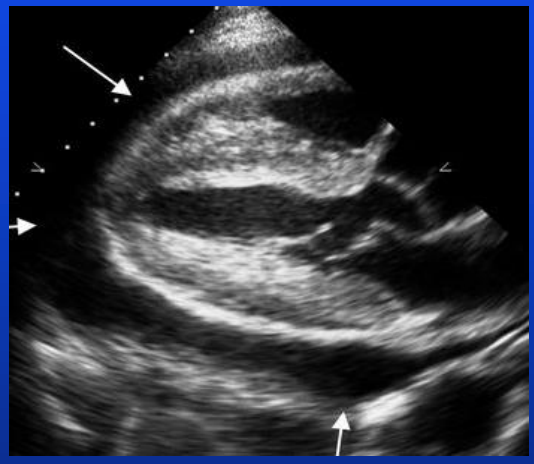
Post-Operative Pericardial Diseases

- **Before post-op day 7: Phase 1**
  - **Post-operative pericardial effusion (POPE): 50-80% patients**
  - **Early tamponades: haemopericardium: 0.5 to 1% of the patients**

- **After post-op day 7: Phase 2**
  - **Post pericardiotomy syndrom (PPS): COPPS-1[1] and COPPS-2[2]**
  - **Persisting moderate to large POPE: POPE-1[3] and POPE-2[4,5]**

(1) Imazio M, (COPPS-1). Eur Heart J. 2010;31:2749-54. (2) Imazio et al COPPS-2. JAMA 2014 ; (3) Meurin et al.POPE-1 Study. Ann Intern Med 2010;152:137-43. (4) Meurin et al. POPE-2. J Am Coll Cardiol 2015 . Meurin et al. POPE-2. Heart 2015.

What is a POPE ?
(Post-Operative Pericardial Effusion)

By definition, a POPE is asymptomatic (otherwise it is a tamponade)

(1) Meurin P, Weber H, Renaud N et al. Chest 2004;125:2182-87. (2) Meurin et al. POPE-1 Study. Ann Intern Med 2010

What is a Post Pericardiotomy syndrom (PPS)? : a pericarditis

Pericardial « Post injury syndrom » family :

- **Initial pericardial injury followed by a pericarditis 1 to 6 weeks later**

  - Auto-immune mecanism[1]

  antibodies anti-heart, anti-pericardium....

- **Another well known post injury syndrom: Dressler syndrome after myocardial infarction**

Guidelines:Management of Pericardial Diseases. European (1) Guidelines. Eur heart J 2004;25:587-610

What is a PPS ?

1- « Large » definition

At least 2 of the following criteria:

- Fever
- Pericardic or Pleuritic Chest Pain
- Pericardial or pleural Rub
- New or Worsening Pleural Effusion
- New or Worsening Pericardial Effusion

⬇

According to this wrong definition, 30% of the patients would « suffer » from a PPS !

2- Clinical PPS= Pericarditis[1]

- After post-op day 7
- Fever 37°8
- Chest Pain
- Pericardial rub or effusion

(Very High CRP Level)

⬇

1-2 % of the patients suffer from a real PPS

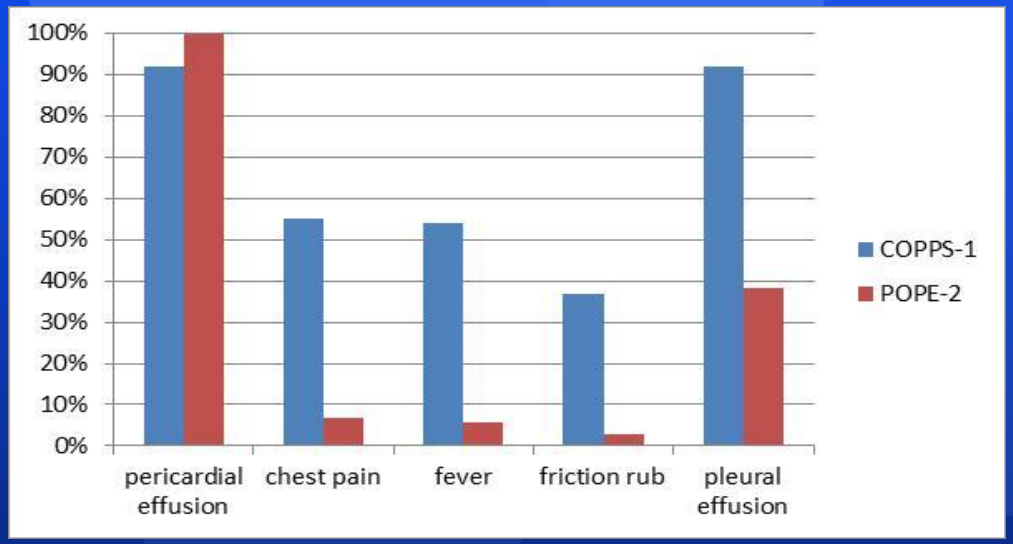
(1) Ofori-Krakye SK et al. Circulation 1981;63:1323-8

Post-operative Pericardial Diseases after day 7: PPS and POPES are very different

Symptoms :

(real) PPS : yes

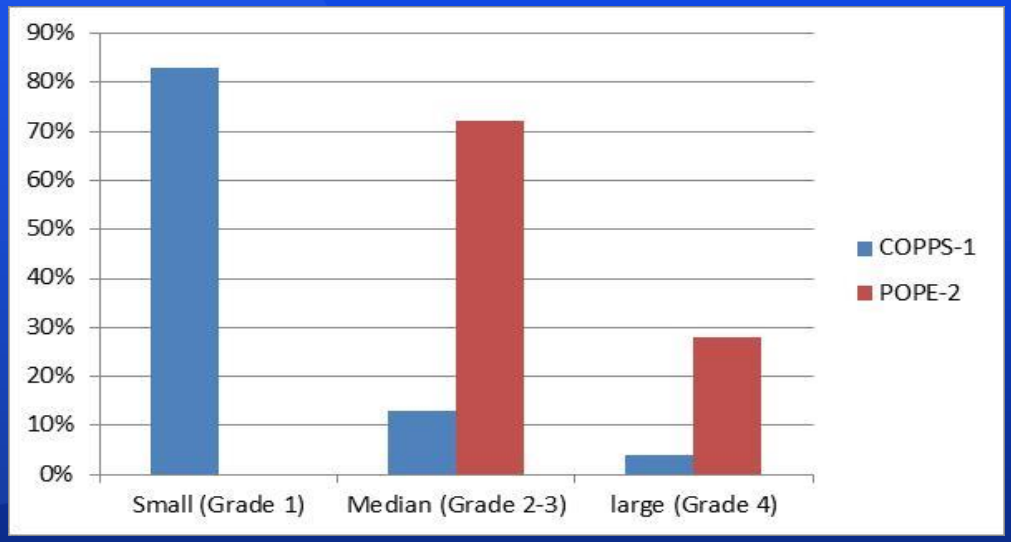
POPES ≈ no

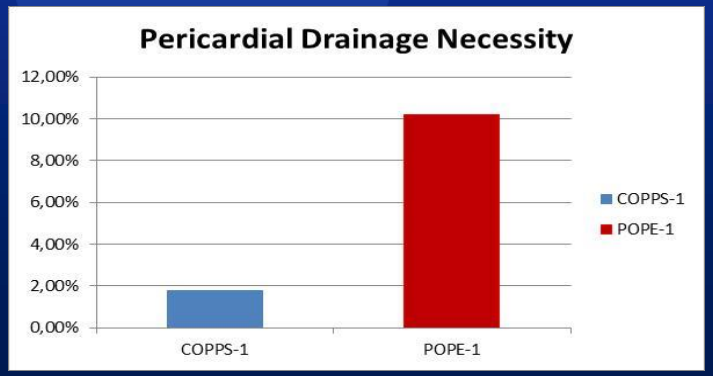


Effusions:

PPS ≈ no or small

POPES: yes, large





PPS ≈ no tamponade risk

POPES = High Tamponade Risk

1- Meurin et al.POPE-1 Study. Ann Intern Med 2010. 2- Imazio et al.COPPS-1 Study. Eur Heart J 2010. 3- Imazio et al Am J Cardiol. 2011

Une prise en charge souvent confuse des épanchements post-opératoires

Par analogie-confusion entre 3 « maladies » différentes :

1. **Les AINS et la colchicine sont efficaces dans la *Péricardite aigue* :**
   - **Prouvé**
2. **Les AINS et la colchicine sont efficaces pour traiter le Syndrome post-péricardiotomie (SPP) : parce que c'est une péricardite aigue**
   - **Prouvé**
3. **Confusion: alors utilisons les pour traiter les épanchements péricardiques post-op asymptomatiques ??**
   - **Pas prouvé. Logique ? Possible ?**

Colchicine (add-on NSAID): a very potent drug for the treatment of symptomatic acute pericarditis

Table 2. Trial Outcomes.*

Outcome	Placebo (N=120)	Colchicine (N=120)	P Value
Incessant or recurrent pericarditis: primary end point — no. (%)‡	45 (37.5)	20 (16.7)	<0.001†
Symptom persistence at 72 hr — no. (%)	48 (40.0)	23 (19.2)	0.001
Remission at 1 wk — no. (%)	70 (58.3)	102 (85.0)	<0.001

Colchicine 0,5 to 1 mg/day for 3 months in addition to conventional NSAID (or aspirin) treatment for 1 month

The ICAP Study. Imazio M et al. N Engl J Med 2013;369:1522-8.

The COPPS-2 study: a Trial of Prevention

Colchicine for prevention of post-pericardiotomy syndrome and post-operative atrial fibrillation: the COPPS-2 randomized clinical trial.

Massimo Imazio, MD, FESC on behalf of the COPPS-2 Investigators
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University of Torino, Torino, Italy
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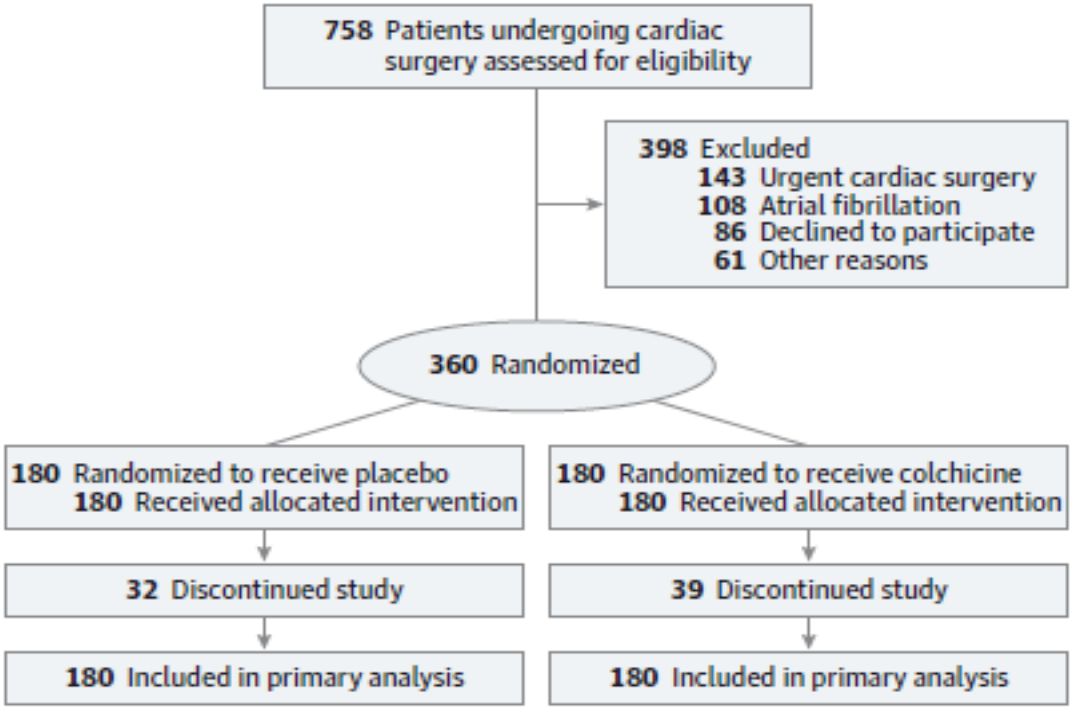
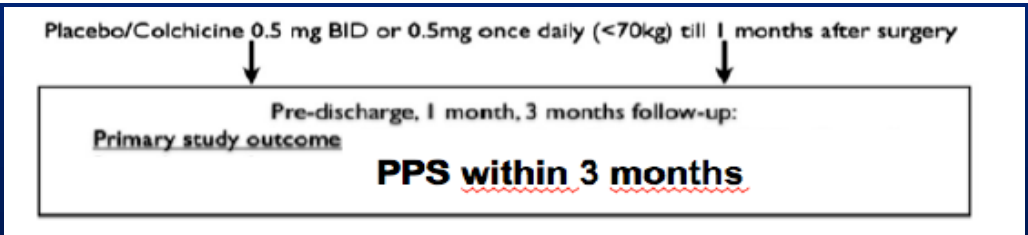
A.S.L. TO2
Azienda Sanitaria Locale Torino nord

UNIVERSITÀ DEGLI STUDI DI TORINO
ALMA UNIVERSITAS TAURINENSIS

COPPS-2 Design

Figure 1. Screening, Enrollment, Randomization, and Follow-up of Study Participants in the COPPS-2 Trial





Imazio M et al. JAMA 2014.

COPPS-2 Results:
Clear « PPS » incidence reduction with colchicine
But what for? Is it clinically meaningful ?

Table 2. Primary and Secondary Study Outcomes at 3-Month Follow-up According to Treatment Assignment

Outcomes	No. (%) of Participants		Absolute Difference (95% CI), %
	Placebo (n = 180)	Colchicine (n = 180)	
Primary end point (postpericardiotomy syndrome) within 3 mo	53 (29.4)	35 (19.4)	10.0 (1.1 to 18.7)
Main secondary end points			
Postoperative atrial fibrillation[a]	75 (41.7)	61 (33.9)	7.8 (−2.2 to 17.6)
Postoperative pericardial/pleural effusions	106 (58.9)	103 (57.2)	1.7 (−8.5 to 11.7)
Cardiac tamponade	3 (1.7)	1 (0.6)	1.1 (−1.6 to 4.3)
Pericardiocentesis or thoracentesis	13 (7.2)	13 (7.2)	0.0 (−5.6 to 5.6)
Postpericardiotomy syndrome recurrence	3 (1.7)	3 (1.7)	0.0 (−3.3 to 3.3)
Disease-related readmissions[b]	2 (1.1)	2 (1.1)	0.0 (−2.7 to 2.7)
Overall mortality[c]	2 (1.1)	6 (3.3)	2.2 (−1.6 to 6.1)
Stroke	1 (0.6)	2 (1.1)	0.50 (−2.1 to 3.4)

No: it is not clinically meaningful :« The overall prognosis of PPS in the trial was good; therefore its preoperative prevention maybe unnecessary given the rate of adverse effects of colchicine ».

Imazio M et al. JAMA 2014.

Colchicine for Post-operative Pericardial Effusion: The Post-Operative Pericardial Effusion (POPE-2) Study. A Multicenter, Double-blind, Randomized Trial

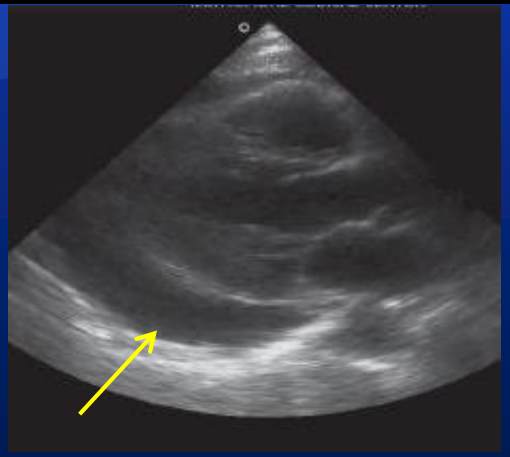
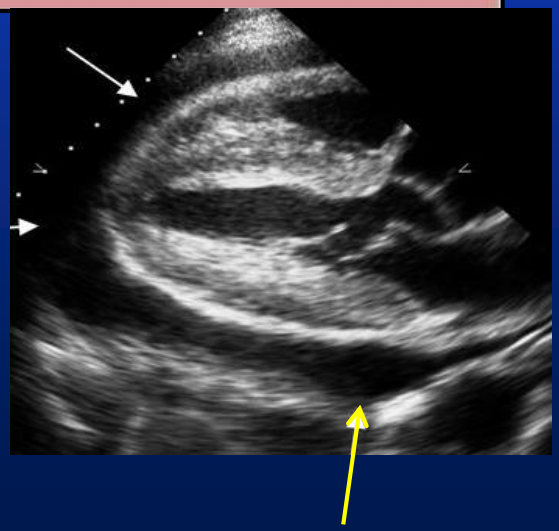
P. Meurin, S. Lelay-Kubas, B. Pierre, H. Pereira, B. Pavy,
MC. Iliou, JL. Bussiere, H. Weber , JP. Beugin, T. Farrokhi,
A.Bellemain-Appaix, L. Briota, JY. Tabet,
for the French Society of Cardiology.

POPE-2 Study: Is colchicine effective in treating POPES and in preventing cardiac tamponade ?

Methods[1]
Quantification of POPEs: Echocardiographic classification[1,2]

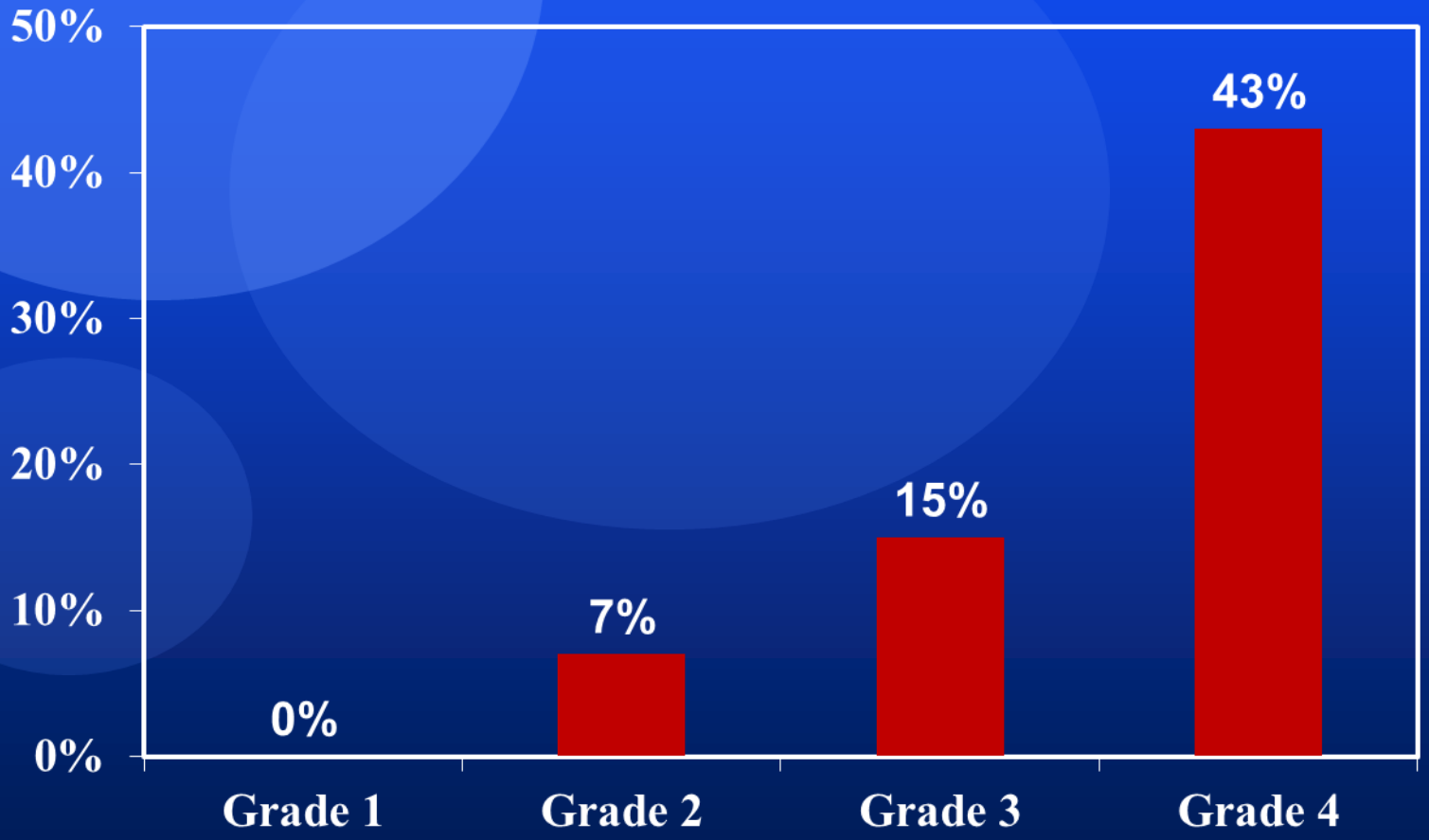
Grade at Day 15 (8-29)	Loculated	Circumferential	Estimated Late Tamponade Risk at Day 30
0	0	0	0
1- Small	< 10 mm	0	0
2-Moderate	10-14 mm	< 10 mm	2-7%
3-Medium	15-19 mm	10-14 mm	15%
4-Large	≥ 20 mm	≥ 15 mm	25-45%

≈ 10%

(1) Meurin P, Weber H, Renaud N et al. Chest 2004;125:2182-87. (2) Meurin et al. POPE-1 Study. Ann Intern Med 2010

Incidence des tamponnades tardives à J 30 en fonction du grade échographique à J 15



p < 0,001

Meurin P, Weber H, Renaud N et al. Chest 2004;125:2182-87.

Methods[2]
Quantification of POPEs Volume

Main endpoint:
Mean (echographic) Pericardial Effusion Grade (MPEG) evolution in the 2 groups (colchicine and placebo)

Example: Determination of the Mean Pericardial Effusion Grade of a group of patients:
(Fictional) Group A : 3 patients

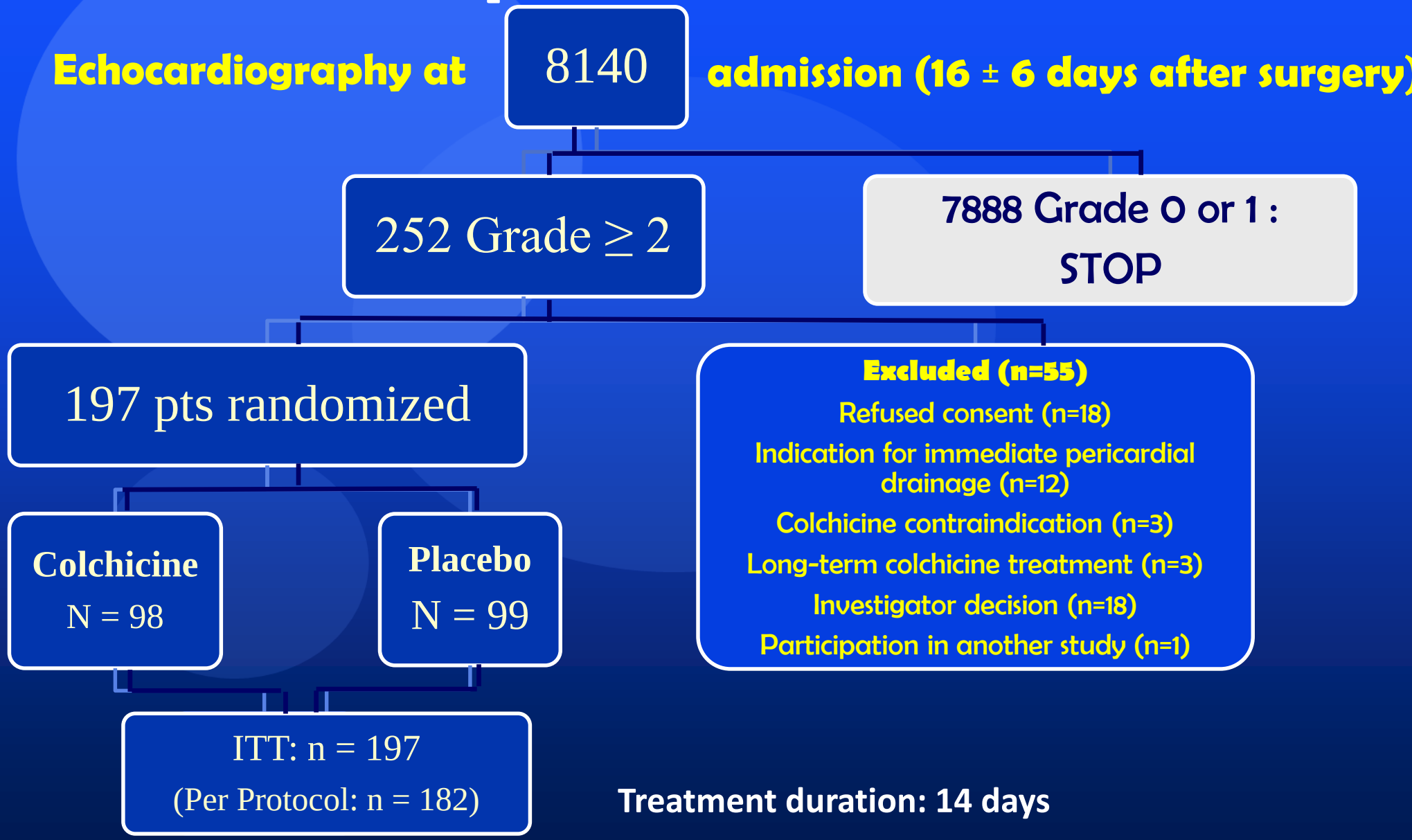
- Patient n°1 : Grade 2
- Patient n°2 : Grade 3
- Patient n°3 : Grade 4

Mean Pericardial Effusion Grade of this fictional Group:

- (2+3+4)/3 = 3

Results

From April 2011 to March 2013



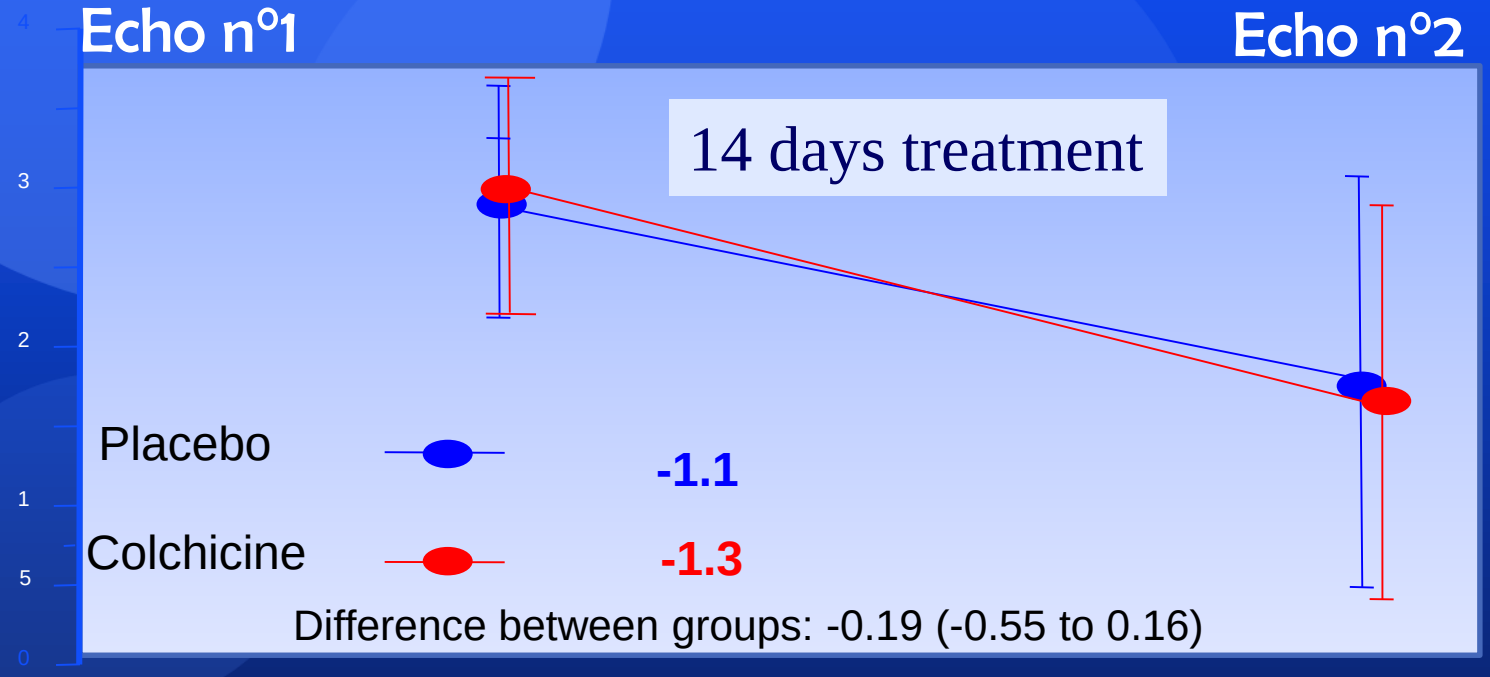
Baseline Characteristics

	Placebo Group (n = 99)	Colchicine Group (n = 98)
Mean Age (SD), years	65±10.	64±12
Male (%)	88 (89 %)	82 (84 %)
Surgery performed - CABG - Ao Valve Replacement - Mitral Valve Surgery - Root Aorta Surgery	 52 % 48 % 39 % 15 %	 59 % 35 % 27 % 15 %
Delay surgery-inclusion	16 ± 5	16 ± 5
Oral anticoagulants - INR at inclusion (SD)	51 % 2.4 ± 0,7	53 % 2.4 ± 0,79
Aspirin	75 %	68 %

POPE mean grade: MPEG	2.9 ± 0.8	3.0 ± 0.8
Grade 2 %	35	27
Grade 3 %	36	43
Grade 4 %	28	28

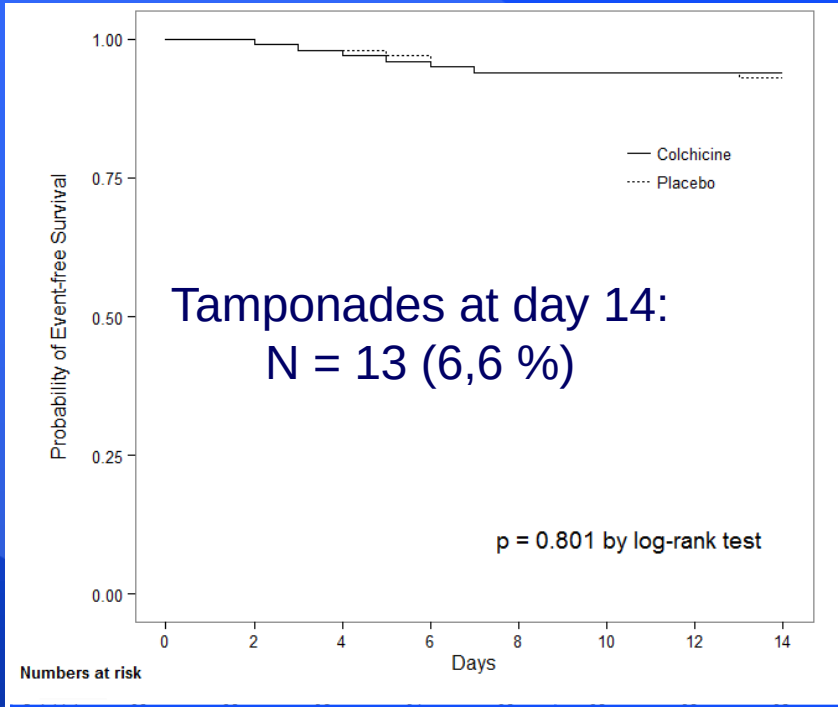
Primary Endpoint:
Mean Pericardial Effusion Grade Decrease

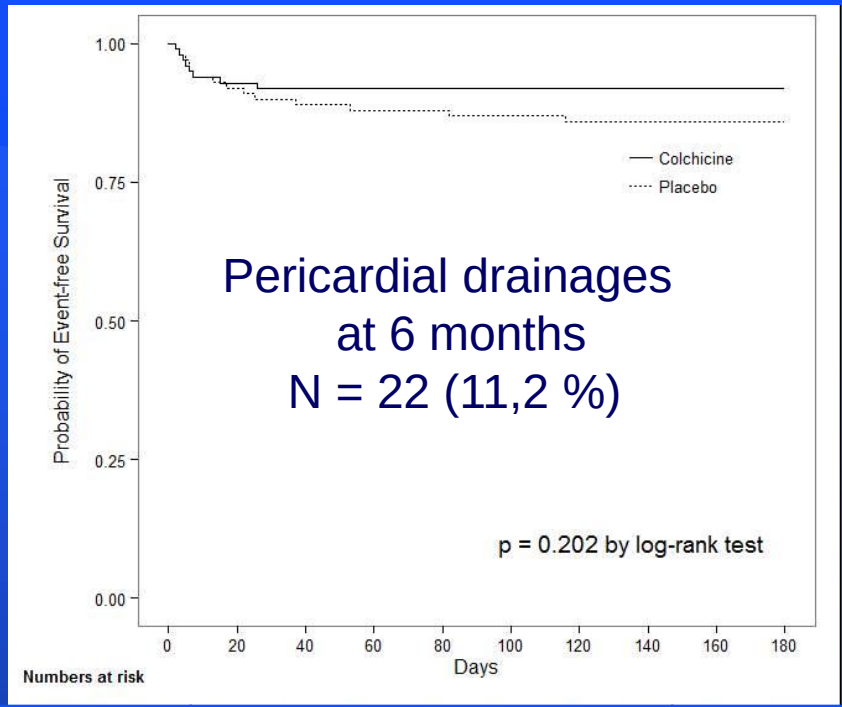
Surgery → Inclusion (Day 16 ± 5) → End of the study (*Day 29.0 ± 7.0*)



Grade	Placebo	Colchicine	Mean (95% CI)	p
Initial	2.9±0.8	3.0±0.8		
Final	1.8±1.3	1.7±1.2		
Change	- 1.1±1.3	- 1.3±1.3	- 0.19 (-0.55 to 0.16)	0.23

Secondary Endpoints





	Placebo Group (n = 99)	Colchicine Group (n = 98)	p
Patients with at least 1 grade decrease	**67 %**	**74 %**	0,27
Reduction of the Echo free space width (mm)	**- 4.7 ± 6.9**	**-5.8 ± 6.1**	0,23
Atrial Fibrillation at the end of the study	**12 %**	**15 %**	0,51

Prespecified Sub-Groups Analysis

MPEG decrease (grades) in Patients	Placebo Group (n=99)	Colchicine Group (n=98)	95% CI	p
With CRP level ≥ 30mg/l (n=82)	-1.3 ± 1.4	-1.4 ± 1.4	-0.11 (-0.72 to 0.49)	0.81
Receiving an oral anticoagulant (n=102)	-0.9 ±1.3	-1.4 ± 1.2	-0.48 (-0.99 to 0.02)	0.06
Per Protocol Analysis (n=182)	-1.1 ± 1.3	-1.3 ± 1.3	0.18 (-0.56 to 0.20)	**0.28**

Conclusion (1)

1- **Moderate** to large persisting (> 7 days) POPE :

banal but dangerous effusion

- High risk of tamponade
- Colchicine administration is useless (POPE-2 study)

[PS: NSAID administration are useless (POPE-1 study)]

2- PPS: post-op auto-immune pericarditis

very rare but benign disease

- "Syndrom" Overdiagnosed in studies, excellent prognosis therefore there is no use in trying to prevent it
- Real PPS : post op acute pericarditis (≈ post MI dressler syndrome)
  - Rare
  - The association aspirin + colchine is effective

Conclusion (2)

1- 22 % des patients opérés ont encore un Epe à l'entrée en CRC dont :

- 62 % de grade 1 : risque de tamponnade = 0 malgré reconditionnement à l'effort)
- 38 % de grade 2.3.4 : risque de tamponnade = 11 % à J 30

  Influence du reconditionnement non évaluable

2- Les facteurs prédictifs de tamponnade sont :

- Grade échographique initial (J 20)
- Traitement AVK

Conclusion (3)

3- Le développement d'une tamponnade tardive peut être prédit par l'ETT réalisée à J 20

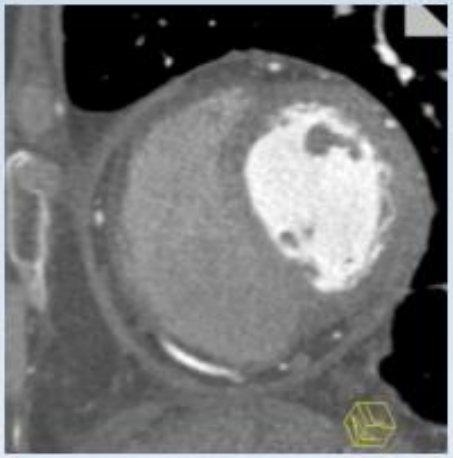
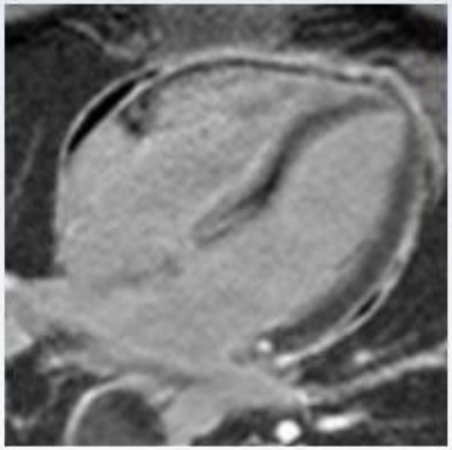
4- La Persistance d'un grade > 1 implique une surveillance écho « armée »

5- Le reconditionnement à l'effort n'est pas dangereux pour les grades 1

Take Home Message (post-op)

	Incidence	Treatment
Pericardial Effusion Post-op pericardial effusion: POPE[1,2]	**40-60 % post op**	No drug Echo twice a week
Acute Pericarditis **Acute viral Pericarditis[3]** Post-op real PPS[3]	 **1-2 % post op**	 Aspirine : 1 month - 3g/day 10 days - 2 g/day 10 days - 1g/day 10days + Colchicine : 3 months - 0,5 to 1mg/day

1) Imazio M, (COPPS-1). Eur Heart J. 2010; 31:2749-54. (2) Meurin et al.POPE-1 Study. Ann Intern Med 2010; 152: 137-43 ; (3)The ICAP Study. Imazio M et al. N Engl J Med 2013; 369: 1522-8.

Highlights: New 2015

- Colchicine Class IA recommendation (always with ASA or NSAIDs)
- Immunosuppressants / Pericardectomy for refractory pericarditis
- Role of Imaging
- Medical treatment option in some cases of constriction
- Exercise restriction