

Abstract 675

Background:

- Lung cancer screening with chest computed tomography (CT) is an opportunity to diagnose other asymptomatic smoking-related complications, such as Coronary artery calcification (CAC)
- Importance of CAC is an independent predictor of coronary heart disease and events.

Objective:

- To evaluate the prevalence and intensity of CAC in a population of asymptomatic HIV-infected smokers over 40 years of age undergoing lung cancer early diagnosis with chest CT.

Methods:

- Cross-sectional post-hoc substudy of the ANRS EP48 HIV-CHEST cohort, a multicenter prospective pilot study evaluating the feasibility of early lung cancer diagnosis with a single chest CT for HIV-infected subjects in France (clinical trials number: NCT01207986) (1).
- Inclusion criteria: age \geq 40 years, smoking \geq 20 pack-years (possibly stopped $<$ 3 years), CD4 T-lymphocyte nadir cell count $<$ 350/ μ l, current CD4-T cell count $>$ 100 cells/ μ l, and available CT for CAC substudy.
- Ungated chest CT in 13 different radiological centers using multi-detector row scanners without contrast material enhancement, acquired in one breath hold, at 100 kV, with section thickness \leq 1 mm (mean effective dose 2.97 mSv, IQR (1.99-4.40)).
- I-ELCAP CAC score calculated (2): calcification on each coronary artery (figure 1) (main, left anterior descending, circumflex, and right) documented as 0 (absent), 1 (mild, $<$ 1/3 of length of entire artery), 2 (moderate, between 1/3 and 2/3 of length included), or 3 (severe, $>$ 2/3 of length). Four arteries score summed (CAC score in the range of 0–12)
- Two radiologists (SB, IB) reviewed the images. A consensus score was defined when scores were discordant.
- Logistic regression models identified factors associated with the presence of CAC (CAC score \geq 1

Results:

- 396 subjects analyzed. Characteristics are shown in table 1.
- 266 subjects had CAC reported on CT (67%, 95% CI [63; 72]): 209 subjects (53%) a CAC score between 1 and 3, 51 subjects (13%) between 4 and 6, and 6 subjects (1.5%) a score of 7 or 8.
- Median follow-up of 24.4 months; 12 subjects had a cardiovascular event (1 unexplained sudden death, 2 symptomatic lower limb arteriopathy, 7 myocardial infarctions, and 2 strokes), of which 11 were male.
- Results of univariate and multivariate analysis of factors associated with CAC are shown in table 2

Characteristics	Value
Age (median), (IQR)	50 (46-54)
Men (%)	329 (83%)
Known duration of HIV infection, median (IQR)	17.6 (10.8-22.3)
Nadir CD4, median (cells/ μ l), (IQR)	168 (76-259)
History of IVDU n (%)	114 (29%)
Last CD4 value (median cells/ μ l)	574 (415-764)
Last viral load $<$ 50 copies/ml (%)	355 (90%)
Duration of ARV treatment, median (years)	14 (7-16)
History of AIDS classifying disease (%)	109 (28%)
Chronic alcohol intoxication, n (%)	78 (20%)
History of HCV infection (%)	133 (34%)
Cigarettes (per day) (IQR)	20 (10-20)
Duration of smoking, (years), (IQR)	30 (28-36)
Cessation of smoking within the last three years (%)	37 (8)
Smoking, pack-years (IQR)	30 (25-40)

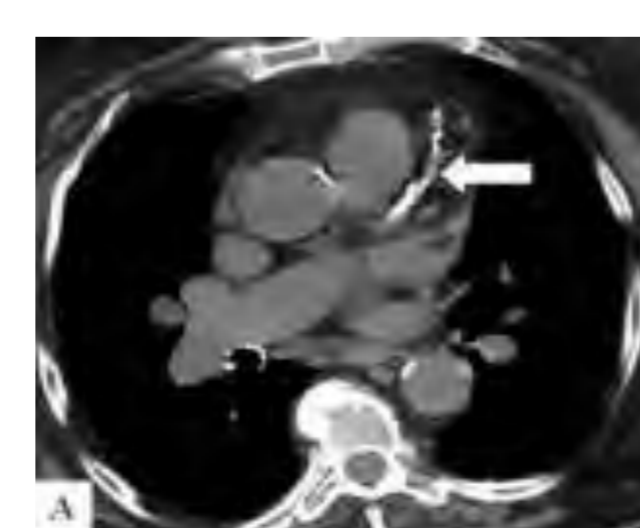
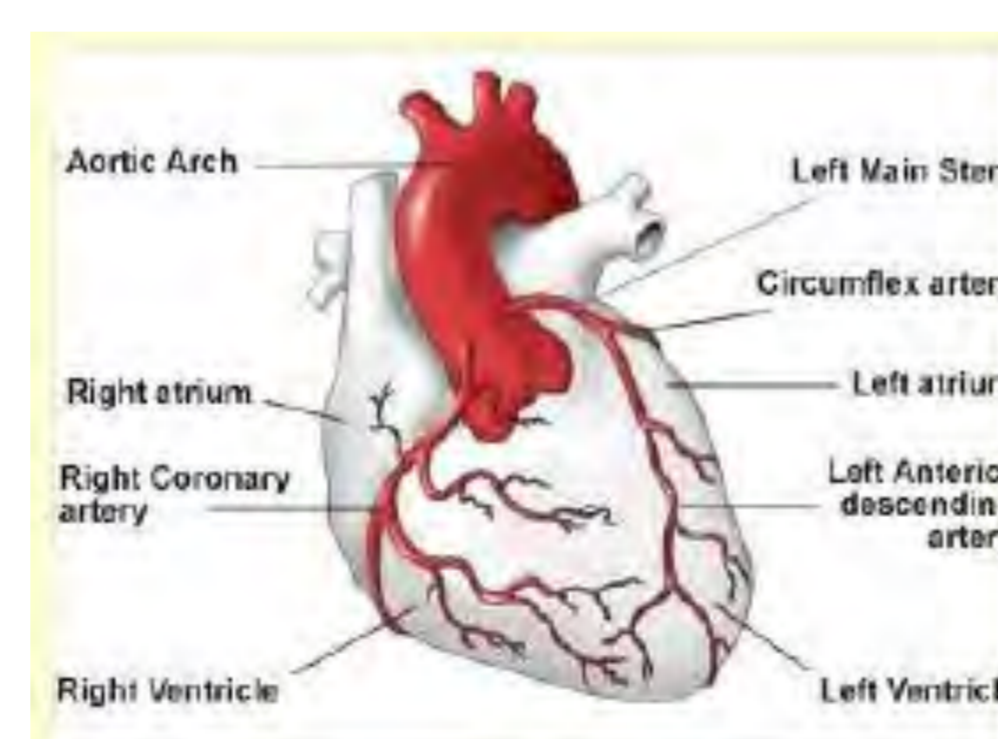


Figure 1 : anatomy of the coronary arteries and an example of left coronary artery calcification

Characteristics	Univariate analysis			Multivariate analysis		
	OR	CI 95%	p	OR	CI 95%	p
Age (per 10 years increase)	2.64	[1.72; 4.04]	0.011	2.29	[1.44; 3.62]	<0.001
Male gender	2.00	[1.17; 3.42]	<0.01	2.03	[1.15; 3.58]	0.015
Cannabis inhalation	0.65	[0.42; 1.00]	0.052	0.67	[0.42; 1.06]	0.086
Pack-years smoking (per 5 pack-years increase)	1.10	[1.00; 1.21]	0.058	1.02	[0.92; 1.13]	0.68
ARV treatment duration (per 5 years increase)	1.27	[1.05; 1.54]	0.012	1.3	[1.06; 1.60]	0.01
History of HCV infection	0.89	[0.57; 1.38]	0.596			
Nadir CD4 (per 100 cells/ μ l increase)	0.79	[0.64; 0.97]	0.022	0.86	[0.69; 1.07]	0.18
CD4 count (per 100 cells/ μ l increase)	0.97	[0.90; 1.05]	0.501			
HIV viral load $<$ 50 copies/mL	0.54	[0.25; 1.18]	0.122	0.49	[0.21; 1.13]	0.09

Table 2: univariate and multivariate analysis of factors associated with CAC. ARV: antiretroviral.

Discussion:

- CAC identified on gated CT scans has been shown to be an independent predictor of coronary heart disease and coronary events (3, 4, 5, 6).
- The I-ELCAP CAC score used in our study has recently shown good correlation with the Agatston score, and a significant association with cardiovascular deaths (7).
- In our study, not only was the prevalence of CAC important (67%), but as much as 15% of subjects had a CAC score of 4 or more.
- The prevalence of CAC of 67% was in the range of that observed in similar studies performed in the general population in subjects who were older and smoked more (8).
- Evaluation of CAC on lung cancer CT screens in high risk HIV-infected subjects should thus be systematically performed, as rates of CAC in PLWHIH that smoke are important and scores high, as shown in our study. Appropriate preventive strategies could reduce coronary events and increase subjects' survival and quality of life in these subjects with important smoking history

Conclusion:

- Prevalence of coronary calcification was important in our cohort, even in young PLWHIV.
- Calcifications were associated with age and sex as well as antiretroviral treatment duration, but neither immunological nor virological factors.
- Chest CT for lung cancer screening in HIV-infected smokers should systematically assess for coronary artery calcifications.
- Whether subjects with a high CAC score should benefit from screening for silent myocardial ischemia remains to be determined.

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Table 1 : subjects' characteristics (n=396). IVDU: Intravenous Drug Use. ARV: Antiretroviral Treatment; HCV: hepatitis C virus. *as assessed by the investigator.