Should patients with an incidental finding of focal myocardial 18FDG uptake be screened by myocardial perfusion scintigraphy?

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Les patients avec une découverte fortuite d'une hyperfixation myocardique focale de ^{18}FDG devraient-ils bénéficier d'une scintigraphie myocardique de perfusion ?

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Abstract

Purpose: Focal F-18-fluoro-deoxy-glucose uptake in the myocardium can be a sign of resting myocardial ischemia. The purpose of our study was to assess the relevance of performing myocardial perfusion scintigraphy to screen for myocardial ischemia in patients with an incidental finding of focal myocardial F-18-fluoro-deoxy-glucose uptake on a routine F-18-fluoro-deoxy-glucose positron-emission-tomography-computed-tomography. *Methods:* In our retrospective multicentric study, patients were included if they had had an incidental finding of myocardial focal F-18-fluoro-deoxy-glucose uptake on a routine F-18-fluoro-deoxy-glucose positron-emission-tomography-computed-tomography and had also undergone myocardial perfusion scintigraphy within 3 months before or after the F-18-fluoro-deoxy-glucose positron-emission-tomography-computed-tomography. Patients with a pattern of ischemia or scar on the myocardial perfusion scintigraphy in the same territory as the focal F-18-fluoro-deoxy-glucose uptake were considered positive. *Results:* Seven of the 34 included patients were positive, with an abnormality on the MPS data in the same territory as the focal myocardial F-18-fluoro-deoxy-glucose uptake. 2 of the 6 patients with focal F-18-fluoro-deoxy-glucose uptake in the left anterior descending vascular supply territory and 2 of the 4 patients with focal F-18-fluoro-deoxy-glucose uptake in the standard right coronary artery territory had an abnormal myocardial perfusion scintigraphy. All 12 patients with focal F-18-fluoro-deoxy-glucose uptake restricted to the basal anterolateral and basal inferolateral segments were negative. *Conclusion:* Patients with an incidental finding of focal F-18-fluoro-deoxy-glucose uptake on a routine F-18-fluoro-deoxy-glucose positron-emission-tomography-computed-tomography may be considered as being at risk for coronary artery disease, when this uptake is multisegmentary in the same typical coronary territory and not restricted to the basal anterolateral and basal inferolateral segments.

^{18}FDG PET/CT, myocardial perfusion scintigraphy, coronary heart disease, focal myocardial ^{18}FDG uptake

Résumé

But : Une hyperfixation focale du ^{18}FDG sur le myocarde peut être un signe d'ischémie myocardique de repos. Le but de notre étude était d'évaluer la pertinence de proposer un complément d'exploration par scintigraphie de perfusion myocardique chez les patients ayant une découverte fortuite d'une hyperfixation myocardique focale de ^{18}FDG sur un TEP/TDM ^{18}FDG de routine. *Matériels et Méthodes :* Dans notre étude rétrospective et multicentrique, nous avons inclus les patients qui ont eu une découverte fortuite d'une hyperfixation myocardique focale sur un TEP/TDM ^{18}FDG de routine et qui ont également bénéficié d'une scintigraphie myocardique de perfusion dans les 3 mois avant ou après le TEP/TDM ^{18}FDG. Les patients avec un diagnostic d'ischémie myocardique ou de séquelle d'infarctus du myocarde sur la scintigraphie myocardique de perfusion dans le même territoire que l'hyperfixation de ^{18}FDG ont été considérés comme positifs. *Résultats :* 7 des 34 patients inclus ont été considérés comme positifs. 2 sur 6 patients avec une hyperfixation focale dans le territoire de l'artère interventriculaire antérieure et 2 sur 4 des patients avec une hyperfixation focale dans le territoire de l'artère coronaire droite avaient une scintigraphie de perfusion myocardique anormale dans le même territoire que l'hypermétabolisme glucidique. Sur les 12 patients avec une hyperfixation limitée aux territoires latérobasaux, aucun n'était positif. *Conclusion :* Les patients avec une découverte fortuite d'une hyperfixation myocardique focale du ^{18}FDG pourraient être considérés comme un groupe à risque de pathologie coronarienne si cette hyperfixation n'est pas restreinte aux segments anterolatero basal et inferolatero basal.

TEP/TDM au ^{18}FDG, scintigraphie myocardique de perfusion, cardiopathie ischémique, hyperfixation myocardique focale

1 Introduction

The human heart uses different energy metabolic pathways to assure its pump function. The major fuels for respiration in the myocardium are carbohydrates and free fatty acids. The preferential energy metabolic pathway switches throughout the day and is determined by a number of parameters, including fasting times and plasma substrate levels [1]. Yet even under strict conditions, the myocardium metabolism remains unpredictable [2]. Glucose is the primary substrate under ischemic conditions because of the anaerobic condition, which stimulates the glucose metabolism [3,4].

The pattern of myocardium uptake of F-18-fluoro-deoxy-glucose (^{18}FDG) can be separated in three groups: no significant uptake, diffuse uptake, and focal or regional uptake [5].

An incidental finding of focal myocardial ^{18}FDG uptake is sometimes detected on the ^{18}FDG positron-emission-tomography-computed-tomography (PET/CT) performed as part of the routine clinical evaluation of solid cancers, hematologic malignancies, inflammatory diseases and infections. Its interpretation is challenging because of the intrinsic inter- and intra-individual variation in myocardial metabolism [6].

Focal ^{18}FDG uptake in the myocardium can be a sign of myocardial ischemia [7], which can include silent ischemia at rest, silent ischemia at stress and hibernating myocardium after a myocardial infarction [8]. This specificity is used in clinical routine to assess myocardial viability in patients who are potential candidates for revascularization procedures after a myocardial infarction, and ^{18}FDG PET/CT is now the method of reference for this assessment [9,10]. Myocardial viability in ^{18}FDG PET/CT can be assessed following a strict protocol of glucose-insulin loading to force the myocardium metabolism toward glucose utilization [11].

But focal ^{18}FDG uptake can also be physiological [12] or part of a noncoronary pathology, like cardiac sarcoidosis [13,14]. Because of its noninvasiveness, high diagnostic performance and wide availability, myocardial perfusion scintigraphy (MPS) using single photon emission computed tomography (SPECT) is a standard method for coronary artery disease (CAD) screening, characterization and follow-up, particularly for silent myocardial ischemia [15,16]. A pattern of scar on the MPS may hide hibernating myocardium. If such pattern is located in the same territory of a ^{18}FDG uptake on a PET/CT, it suggests the presence of myocardial viability. Indeed myocardial hypoperfusion on MPS covers a range of different intensities of myocardial ischemia from stress myocardial ischemia to hibernating myocardium and may underestimate viability especially with sestamibi [17].

The goal of this retrospective study was to assess whether MPS should be used to look for potential CAD in patients who present with an incidental discovery of focal ^{18}FDG uptake in the myocardium on routine clinical ^{18}FDG PET/CT.

In most cases, patients who require medical imaging by ^{18}FDG PET/CT have diseases with a poor prognosis, are under heavy treatment, are older than the average population and may have several comorbidities. These patients are more likely to develop the cardiovascular complications of chronic disease, treatment side effects, and the risk factors associated with cancer [18].

2 Methods

2.1 Patients

This retrospective observation study was approved by our institutional review board (number 2019_IRB-MTP_02-03).

All patients were retrospectively recruited from the nuclear medicine departments of Montpellier University Hospital, France, and Nimes University Hospital, France, between January 2015 and May 2019. During this period, patients with an incidental finding of focal myocardial ^{18}FDG uptake on a routine ^{18}FDG PET/CT and who had undergone MPS within 3 months before or after the ^{18}FDG PET/CT were included. The cases showing focal myocardial ^{18}FDG uptake were identified by retrospective review. Patients who had had the ^{18}FDG PET/CT specifically to assess cardiac disease were not included.

2.2 ^{18}FDG PET/CT protocols

Montpellier University Hospital and in Nimes University Hospital, ^{18}FDG PET/CT acquisitions were performed 60 minutes following an IV injection of 3.5 MBq/kg of ^{18}FDG after a fasting period of at least 4 hours. The PET axial field of view encompassed brain, neck, thorax, abdomen, and pelvis. In Montpellier, PET/CT acquisitions were performed using a Siemens Biograph mCT 20 Flow scanner with time-of-flight mode. Images were reconstructed using the manufacturer's dedicated software and specifications (3D OSEM using 21 subsets and 2 iterations including PSF correction followed by post-filtering with a 3-mm wide Gaussian kernel). Image matrices were sampled on a 400x400 grid with a voxel size of 2x2x2 mm^3. In Nimes, PET/CT examination was performed using a General Electric Healthcare Discovery 710 Elite with time-of-flight mode. Images were reconstructed using the manufacturer's dedicated software and specifications (VUE Point FX - SHARP IR – QCLEAR 400 and no filter). Image matrices were sampled on a 256x256 grid with a voxel size of 4x4x4 mm^3. The attenuation correction for PET was based on the CT data. PET/CT data were analyzed by a nuclear medicine specialist using the Syngo.via viewer (Siemens) in Montpellier and using the Advantage Workstation (General Electric Healthcare) in Nîmes.

Focal myocardial ^{18}FDG uptake was interpreted from the axial, sagittal, coronal projections and the maximum intensity projection (MIP) on the PET images.

The description of left ventricular myocardial metabolism was based on the nomenclature and standardized segmentation published by the American Heart Association [19]: 17 segments that have reasonably consistent vascular supply from the three main coronary arteries: right coronary artery (RCA) (segments 3, 4, 9, 10 and 15), left anterior descending artery (LAD) (segments 1, 2, 7, 8, 13, 14 and 17) and left circumflex artery (LCx) (segments 5, 6, 11, 12 and 16). In this study, focal ^{18}FDG uptake was defined as an unique segmentary or multisegmentary myocardial uptake in one of the three main vascular supply territories. Patients with circumferential basal uptake, focal uptake restricted to the papillary muscles or with more than one myocardial focal ^{18}FDG uptake were not included.

2.3 Myocardial perfusion scintigraphy: Protocols

At Montpellier University Hospital, patients were imaged using a solid-state dedicated cardiac camera (Discovery NM530c; General Electric Healthcare). They refrained from caffeine and methylxanthine-containing substances for at least 12 hours before their scans. Patients underwent a 1-day rest/stress protocol. The imaging was performed after IV injection of 3.7 MBq/kg of ^{99m}Tc-tetrofosmine at rest and 11 Mbq/kg ^{99m}Tc-tetrofosmine at peak stress. The stress tests were performed on a treadmill with a 12-lead ECG monitored by a cardiologist. The stress acquisitions were completed by IV injection of dipyridamole in patients without medical contraindication.

At Nimes University Hospital, patients were imaged using a conventional two-headed hybrid gamma camera (SPECT/CT NMCT 670; General Electric Healthcare). They refrained from

caffeine and methylxanthine-containing substances for at least 12 hours before their scans. Patients underwent a 1-day stress protocol if no abnormality was identified and a 1-day rest/stress protocol if an abnormality was detected on the stress screening. The imaging was performed after injection of 3.7 MBq/kg of ^{99m}Tc-sestamibi at peak stress and 11 MBq/kg ^{99m}Tc-sestamibi at rest. The stress tests were performed on a treadmill and monitored with a 12-lead ECG by a cardiologist. The stress acquisitions were completed by IV injection of dipyridamole in patients without medical contraindication.

SPECT data were analyzed by a nuclear medicine specialist using Xeleris software (General Electric Healthcare) in both Montpellier and Nimes. On the SPECT data, ischemia was defined as a reversible stress perfusion defect and scar as a significant fixed defect with corresponding abnormal wall thickening. Fixed defects with normal wall thickening at rest in the same segment were regarded as artifacts. A scar pattern on the MPS in the same territory as ^{18}FDG uptake on the ^{18}FDG PET/CT suggested myocardial viability.

Patients with a pathological finding (ischemia or scar) on the SPECT data in the same territory as the ^{18}FDG uptake on the PET/CT were considered positive.

2.4 Statistical analysis

Categorical variables are characterized in terms of number (percentage) and continuous variables are presented as mean value ± standard deviation.

3 Results

Of 235 patients who had undergone MPS within 3 months before or after a ^{18}FDG PET/CT, 34 patients with a discovery of a focal myocardial ^{18}FDG uptake (24 males, 10 females;

63.3±12.1 years) were included in the study. The demographic, anthropometric characteristics, clinical indications of 18FDG PET/CT and the distribution of the main cardiovascular risk factors in this population are listed in **Table 1**. Nine patients from Nimes University Hospital and 25 patients from Montpellier University Hospital.

7 of the 34 patients had abnormal SPECT data in the same territory as the myocardial ^{18}FDG uptake and were considered positive. 4 of the 7 positive patients had pattern of ischemia on the SPECT data and 3 of the 7 positives had pattern of scar on the SPECT data. The myocardial ^{18}FDG uptake was multisegmentary in the same coronary territory in all 7 positive patients. All patients with a ^{18}FDG hot spot restricted to one segment had negative SPECT myocardial perfusion scintigraphy.

Figure 1 summarizes the localization of the myocardial ^{18}FDG uptake in the overall population and the repartition of patients with a positive MPS. ^{18}FDG focal uptake was more frequent in the LCx territory (71%).

In the LCx territory, 3 of 24 patients had a positive MPS scintigraphy (1 pattern of ischemia and 2 patterns of scar). 12 of these 24 patients had a focal myocardial ^{18}FDG uptake restricted to the basal anterolateral and basal inferolateral segments (segments 5 and 6). 0 of these 12 patients had a positive MPS scintigraphy. This pattern is described in **Figure 2**.

3 of the 12 patients with a focal myocardial ^{18}FDG uptake in the LCx territory wider than segments 5 and 6 were positive on MPS scintigraphy. **Figure 3** shows a patient with a pattern of scar in the LCx territory. 2 of these 3 patients underwent a coronary angiography consecutive to the MPS: one was a >70% stenosis of a left marginal artery and one was a

chronic occlusion of LCx. The third patient had a complementary stress echocardiography, which corroborated the findings of the SPECT data (lateral myocardial infarction), but no coronary angiography was required, according to the cardiologist.

In the LAD territory, 2 of 6 patients were positive on MPS scintigraphy (2 pattern of ischemia). **Figure 4** shows a patient with a pattern of ischemia in the LAD territory. These 2 patients underwent coronary angiography following the MPS: one was a chronic occlusion of LAD and one showed an absence of significant restenosis in a previously placed LAD stent.

In the RCA territory, 2 of 4 patients were positive on MPS scintigraphy (1 pattern of ischemia and 1 pattern of scar). **Figure 5** shows a patient with a pattern of scar in the RCA territory. One of these patient underwent coronary angiography following the MPS which concluded in a chronic occlusion of RCA2. For the second patient with a finding of a 10% inferior wall scar on the MPS data, the cardiologist required only follow-up.

4 Discussion

Soon after the first PET scanners were introduced into practical routine, ^{18}FDG PET/CT became the preferred technique for imaging heart glucidic metabolism. In daily clinical routine, nuclear medicine specialists regularly observe focal ^{18}FDG uptake in a myocardium wall. The nonuniformity of myocardial accumulation of ^{18}FDG is well known and focal disparities have been described, with the septum and anterior walls showing less activity than the inferior and lateral walls [6]. Indeed, the shift in energy metabolism from glucose oxidation to fatty acid oxidation is spatially and temporally heterogeneous [2]. Myocardial glucose utilization depends on several parameters, notably the fasting length. However, it is increased on ^{18}FDG PET/CT in a context of resting ischemia, even without clinical or ECG

signs in patients with unstable angina [4]. Myocardial glucose utilization is also increased in viable myocardium after myocardial infarction and ^{18}FDG PET is currently the method of reference to assess the viability [9,20]. Since glucose metabolism in the fasting state is heterogeneous and unpredictable even in the normal myocardium, it is challenging to diagnose the presence of CAD by fasting ^{18}FDG PET imaging alone, at rest. Indeed, focal ^{18}FDG uptake may have many other pathological etiologies such as cardiac sarcoidosis [14,13] and primitive or secondary tumors [21,22]. Several patterns of focal ^{18}FDG uptake have been described, such as increased uptake in the right atrium in atrial fibrillation [23] and a defect of ^{18}FDG fixation in the septal wall in patients with complete left branch block [24]. Correlation between an incidental finding of focal ^{18}FDG uptake in the apex and anterior wall and CAD had been described by Minamito et al. [25] in a retrospective study of 20 patients who had undergone ECG, US, MPS, CT coronary angiography and invasive x-ray coronary angiography. Garcia et al. showed a further correlation between myocardial vessel calcifications and the frequency of focal ^{18}FDG myocardial uptake [26]. Finding of unknown ischemia on an MPS performed after finding a focal ^{18}FDG uptake has been described in a case report [27].

Our study confirms that myocardial ^{18}FDG uptake restricted to the basal lateral segments (segments 5 and 6) should not be considered a pattern for CAD and that no further investigations are needed in this case. Such findings have been described and the studies concluded that the basal lateral (segments 5 and 6) pattern should be considered physiological [28,5]. Indeed none of the 12 patients with this pattern had a positive MPS in our study. This typical pattern is shown in **Figure 3**.

Myocardial ^{18}FDG uptake was more frequent in the LCx territory than in the LAD and RCA territories. These findings confirm an earlier report that the lateral wall is probably the last part of the myocardium to shift from glycolysis to beta oxidation in its energy metabolism. Indeed, Gloper et al. showed that there is overall more ^{18}FDG activity in the lateral wall than in the rest of the myocardium [6].

In our study, 7 of the 34 patients had abnormal SPECT data (ischemia or scar based on the MPS) in the same standard vascular supply territory as the finding for the myocardial ^{18}FDG uptake. Despite the low numbers of patients included, our results suggest that it might be relevant to propose a screen test for myocardial ischemia in patients with an incidental finding of a focal myocardial ^{18}FDG uptake. Indeed in our study, the third of patients (2 on 6 patients) with ^{18}FDG hotspot in the LAD territory were positive, the half of patients (2 on 4 patients) with ^{18}FDG hotspot in the RCA territory were positive and the quarter of patients (3 on 12 patients) with ^{18}FDG hot spot in the LCx territory wider than the segments 5-6 were positive. But a study with a much wider population is required to confirm these results. No further investigations were done in patients with ^{18}FDG hot spot and normal MPS.

3 of the 7 positive patients had an MPS with a pattern of scar. The high ^{18}FDG uptake in these patients suggested a viable myocardium. Indeed, myocardial viability can be determined by the mismatch between the high ^{18}FDG metabolism in the same territory as the hypoperfusion on the SPECT rest and stress acquisitions.

However, focal ^{18}FDG uptake remained nonspecific in the majority of the patients in our study and should not be considered pathological without further investigations, especially if located in the LCx vascular supply.

Prevalence of focal myocardial ^{18}FDG uptake in the 235 patients who had had a PET/CT and a MPS less than 3 months apart was 14%. The prevalence of focal myocardial ^{18}FDG uptake might be overestimate in this study, as compared to the standard population who underwent ^{18}FDG PET/CT, because the majority of the MPS were done following the finding of the focal myocardial ^{18}FDG uptake.

In 6 of the 7 positive patients, the MPS was performed after the findings on the PET/CT and no anteriority of CAD before the incidental finding of the ^{18}FDG uptake had been found for 5 of the 7 positive patients, indicating the importance of documenting this finding in the medical report. One of the two patients with anteriority of CAD had a stent in the LAD following an acute coronary syndrome and the other was only medically treated for stable angina.

Patients who require ^{18}FDG PET examinations often have a disease with poor prognosis (malignant tumors), may have several comorbidities [29], are generally older than the average population and may be under heavy medication (possibly cardiotoxic and/or immunosuppressive therapy), all of which may lead to cardiac disease. These patients are more likely to develop the complications of a chronic inflammatory state, treatment side effects and chronic infection. Moreover, cancer can be considered a standalone cardiovascular risk factor [30]. Patients with oncologic diseases who need PET/CT investigation may be

considered a group at risk of CAD, similar to populations of diabetic patients and HIV-infected patients [31].

The main limitation of our study was the low number of patients included in the analysis. An other limitation of the study was that 2 of the 7 positive patients did not undergo invasive coronarography angiography following the discovery of the perfusion abnormality on the MPS. But the 2 patients had a cardiac follow up following the results of the MPS.

The retrospective nature of this study is also a major limitation for extrapolating our findings. This study was designed to evaluate the relevance of myocardial perfusion scintigraphy for patients with focal myocardial uptake on a ^{18}FDG PET/CT, without considering account the cardiac histories of the patients. Some of the MPS were performed following the discovery of the myocardial focal uptake on the PET/CT, whereas other MPS were completely unrelated to the PET/CT and were performed in patients with known CAD or in patients with cardiovascular risk factors, in line with the guidelines and indications for MPS. A prospective study may be useful to prevent this potential bias.

5 Conclusion

Our study confirms that the diagnosis of coronary artery disease might be suspected in patients with an incidental finding of myocardial focal ^{18}FDG uptake, only when this finding is multisegmentary in the same typical coronary vascular territory and not restricted in the basal anterolateral and basal inferolateral segments. Indeed, our study suggests that these patients may be considered as being at risk for CAD and that a screening test to detect CAD might be justified. Focal ^{18}FDG uptake in the basal anterolateral and basal inferolateral

segments should no lead to further investigation. However, prospective studies and studies with wider population are needed to assess the relevance of our findings regarding CAD screening.

Conflict of interests: None

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Figure 1

Localization of the focal myocardial ^{18}FDG uptake in the overall population and by coronary vascular supply territory. *basal anterolateral and basal inferolateral segments

*Localisation de l'hyperfixation myocardique focale de 18FDG dans la population par territoire coronaire. *segments anterolatero basal et inferolatero basal*

Figure 2

Example of patients with focal myocardial ^{18}FDG uptake restricted to the basal anterolateral and basal inferolateral segments (segments 5 and 6).

Exemple de patients avec une hyperfixation myocardique focale restreinte aux segments anterolatero basal et inferolatero basal (segments 5 et 6)

Figure 3

Example of a 74-year-old female patient with a multisegmentary ^{18}FDG uptake in LCx territory. SPECT perfusion imaging showed pattern of scar in the lateral wall. The discordance between the high ^{18}FDG uptake and the hypoperfusion suggests myocardial viability in the lateral wall. The coronary angiography, consecutive to the MPS, showed a chronic occlusion of the LCx.

Exemple d'une patiente de 74 ans avec une hyperfixation myocardique de 18FDG touchant plusieurs segments dans le territoire de l'artère circonflexe. La scintigraphie myocardique de perfusion retrouvait un pattern de séquelle dans la paroi latérale. La discordance entre l'hypoperfusion et l'hypermétabolisme glucidique indiquait la présence de viabilité myocardique. La coronarographie, réalisée dans les suites, a retrouvé une occlusion chronique de l'artère circonflexe.

Figure 4

Example of an 86-year-old patient with focal myocardial ^{18}FDG uptake in the LAD territory. The myocardial perfusion scintigraphy showed a partially reversible ischemia in the LAD territory. The coronary angiography showed an absence of significant restenosis in a previously placed LAD stent.

Exemple d'un patient de 86 ans avec une hyperfixation focale de 18FDG dans le territoire de l'interventriculaire antérieure. La scintigraphie myocardique de perfusion montrait une ischémie partiellement réversible dans le territoire de l'interventriculaire antérieure. La coronarographie, réalisée suite à la scintigraphie myocardique, n'a pas montré de resténose significative du stent de l'IVA qui avait été mis en place de manière antérieure.

Figure 5

Example of a 67-year-old male patient who underwent ^{18}FDG PET/CT for the evaluation of a pulmonary adenocarcinoma. ^{18}FDG PET/CT showed ^{18}FDG uptake in the myocardial inferior wall. SPECT perfusion imaging showed hypofixation in the inferior wall both at rest and stress (wider at stress), suggesting myocardial infarction with perilesional ischemia. The discordance between the high ^{18}FDG uptake and the hypoperfusion suggests myocardial viability in the inferior wall. The coronary angiography, consecutive to the MPS, showed a chronic occlusion of the RCA.

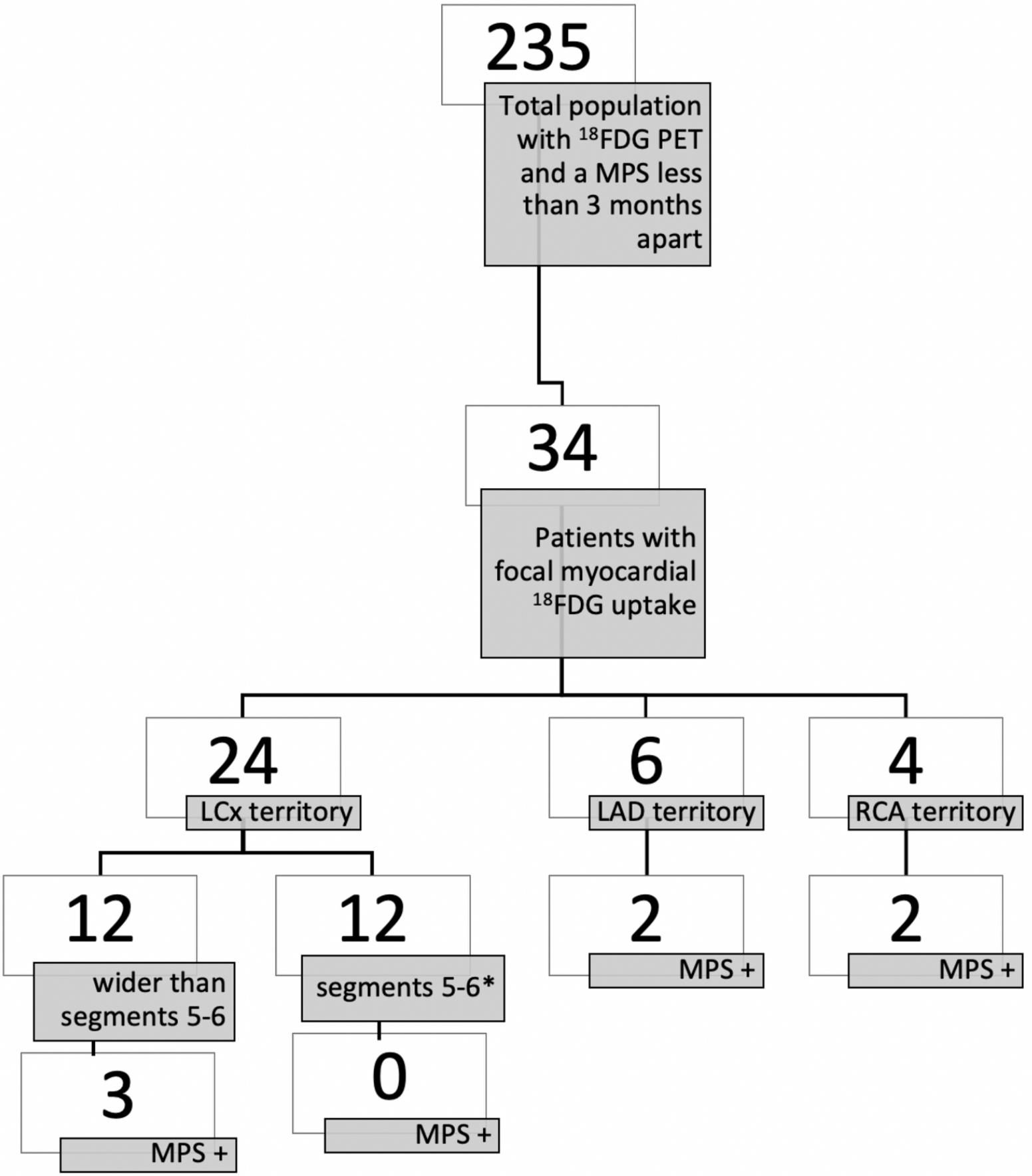
Exemple d'un patient de 67 qui avait bénéficié d'un TEP/TDM 18FDG pour l'évaluation d'un adénocarcinome pulmonaire. Le TEP/TDM 18FDG montrait une hyperfixation focale au niveau de la paroi inférieure. La scintigraphie myocardique de perfusion montrait une séquelle avec ischémie péri-lésionelle. La discordance entre l'hypoperfusion et l'hypermétabolisme glucidique indiquait la présence de viabilité myocardique. La coronarographie, réalisée suite

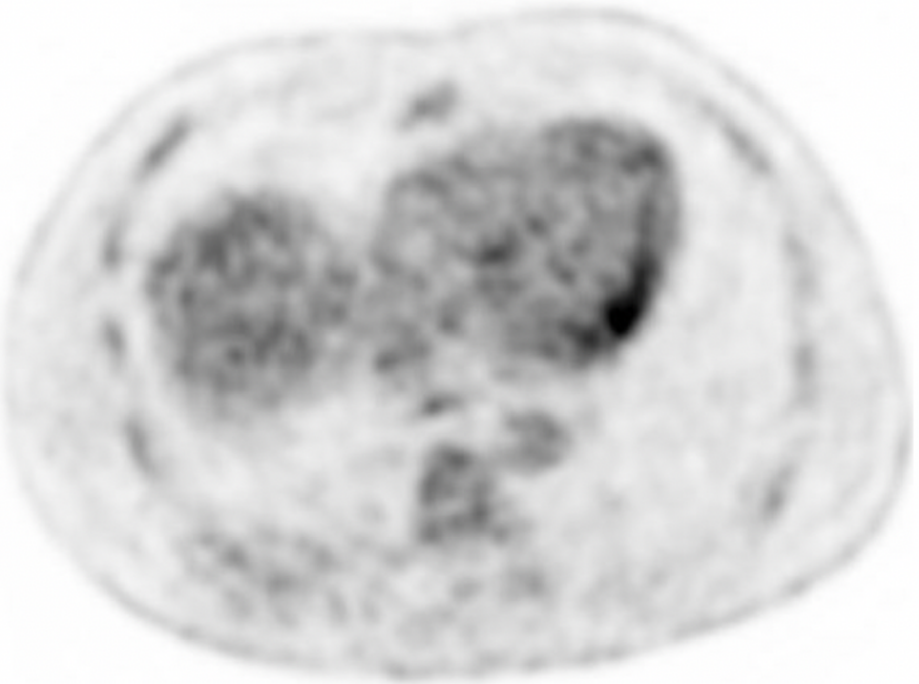
à la scintigraphie myocardique, a retrouvé une occlusion chronique de l'artère coronaire droite.

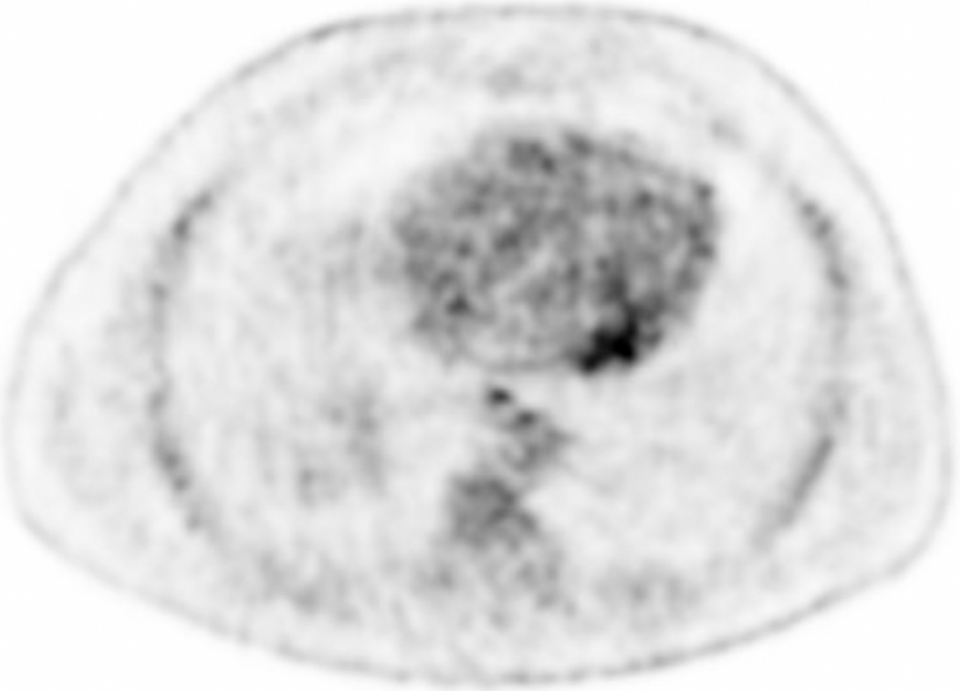
Table I

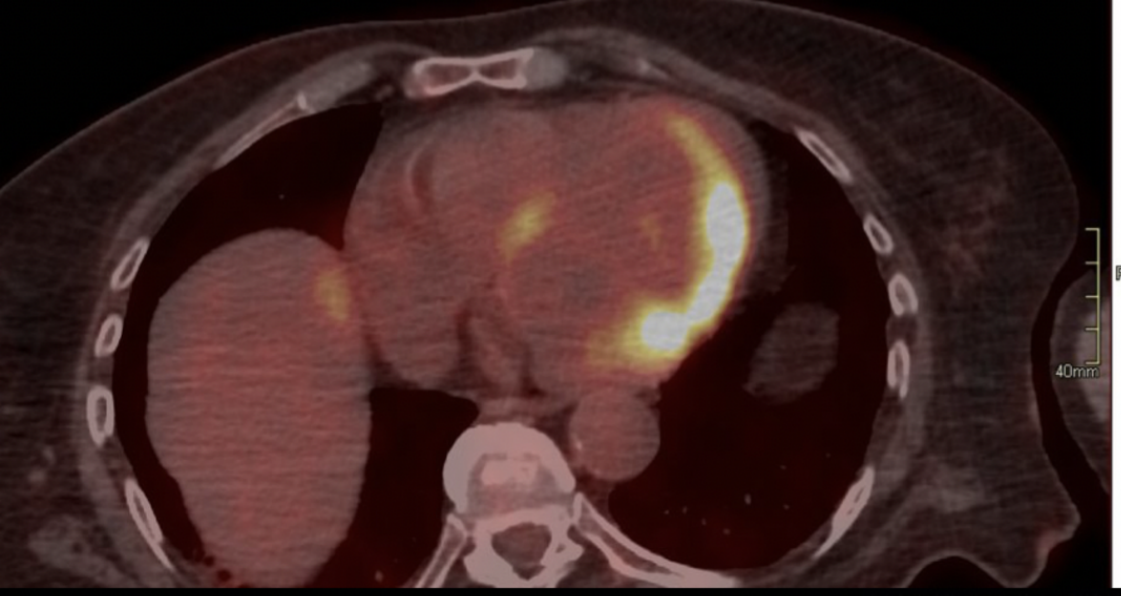
Demographic, anthropometric characteristics, clinical indications of ^{18}FDG PET/CT and distribution of the main cardiovascular risk factors in the population.

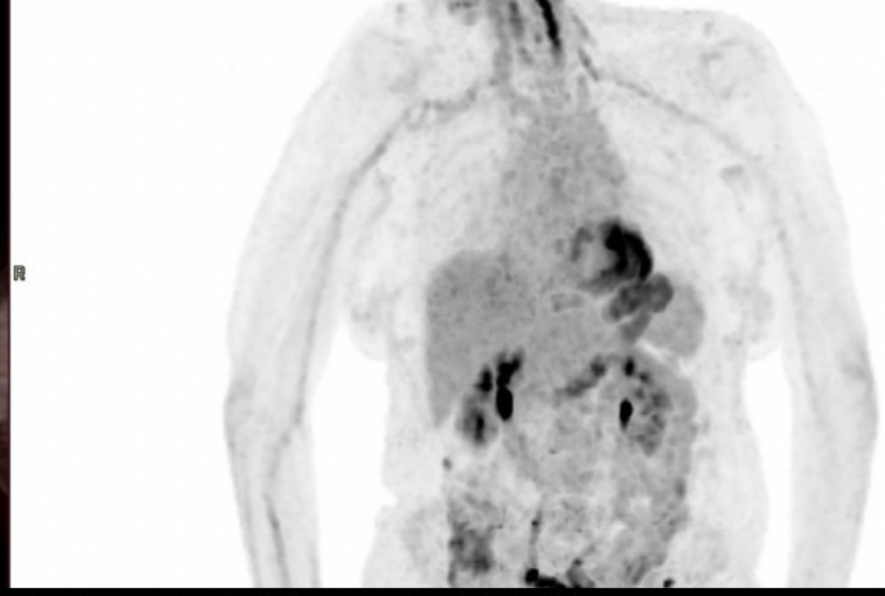
Données démographiques et anthropométriques, indications des TEP/TDM au ^{18}FDG et distribution des principaux facteurs de risques cardio-vasculaires dans la population.


235
Total population with ^{18}FDG PET and a MPS less than 3 months apart
34
Patients with focal myocardial ^{18}FDG uptake
24
LCx territory
6
LAD territory
4
RCA territory
12
wider than segments 5-6
12
segments 5-6*
2
MPS +
2
MPS +
3
MPS +
0
MPS +









STRESS_IRNCRR(G

REST_IRNCRR(G)

TID: 1.19 (67/56)

EF: 43%

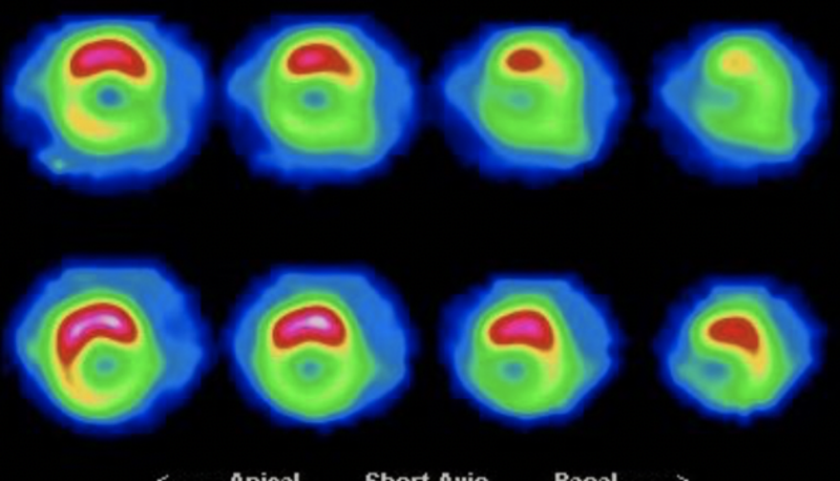
EDV: 70ml

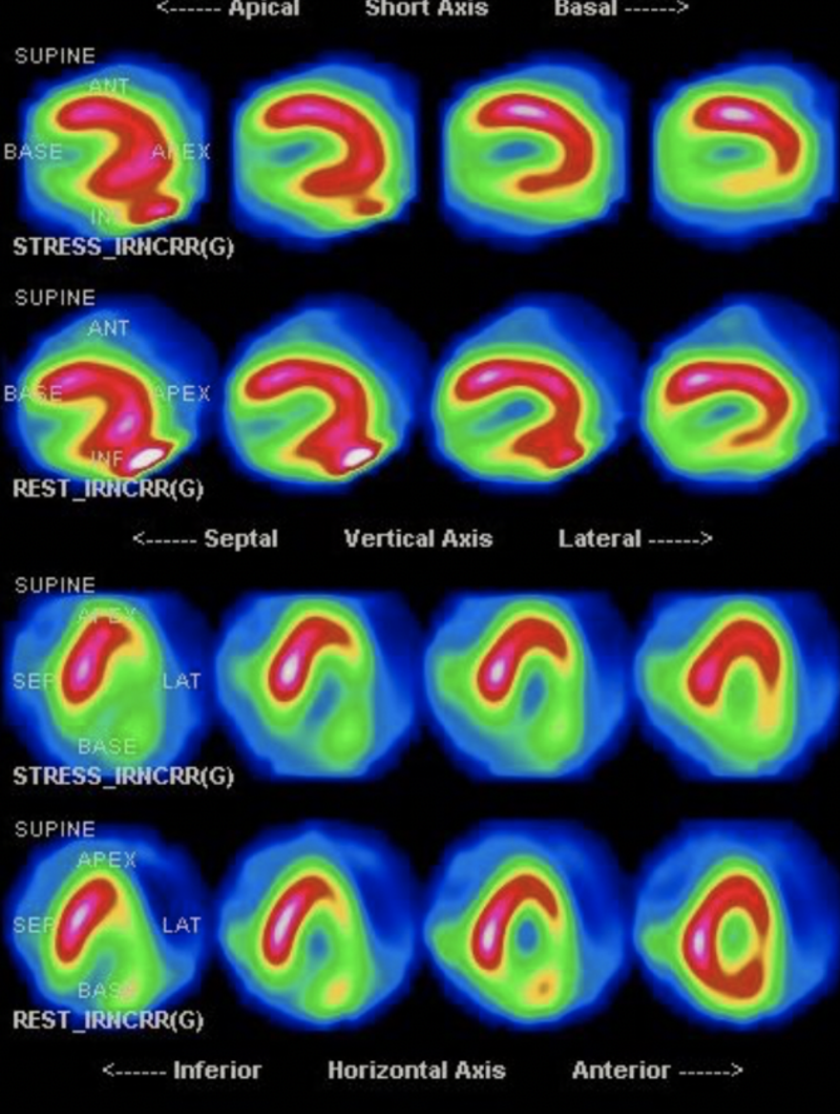
ESV: 40ml

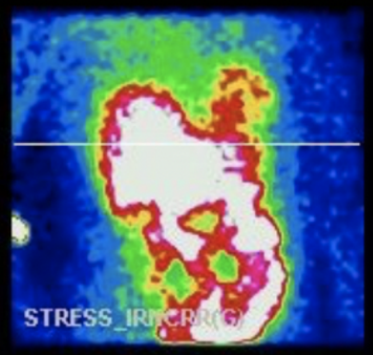
EF: 69%

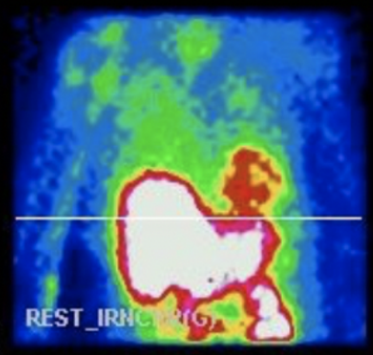
EDV: 70ml

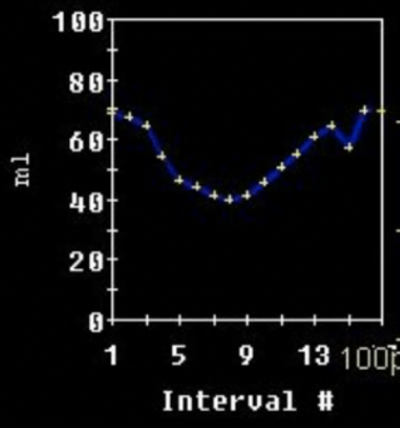
ESV: 22ml

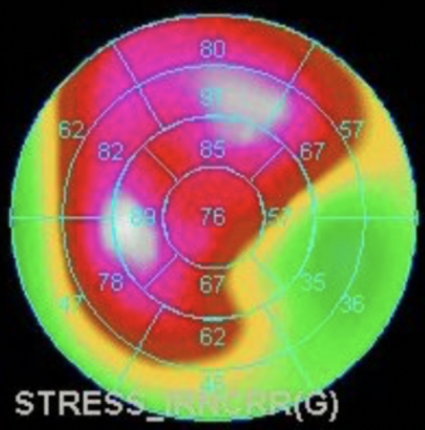


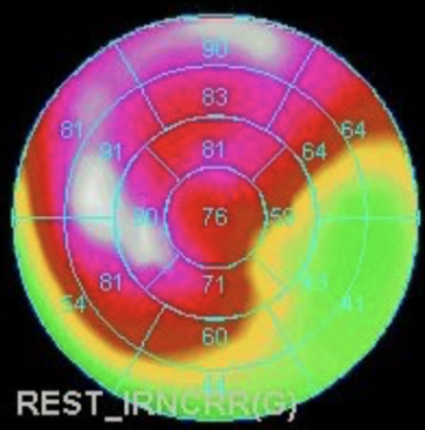


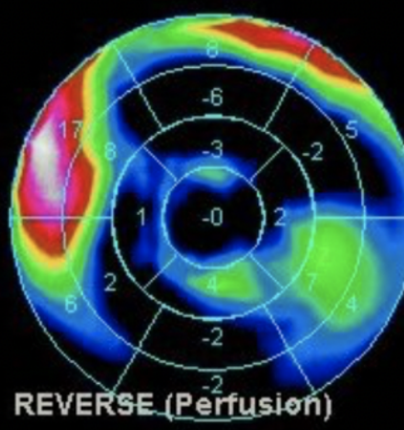


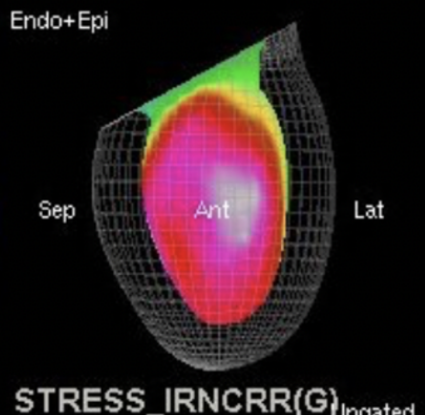


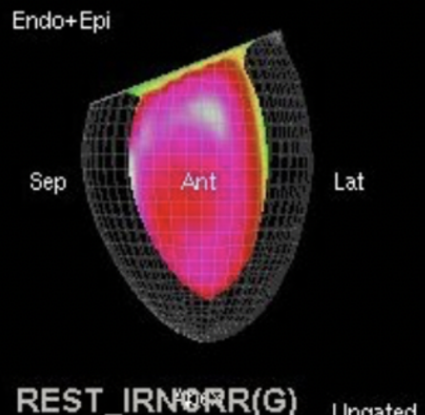


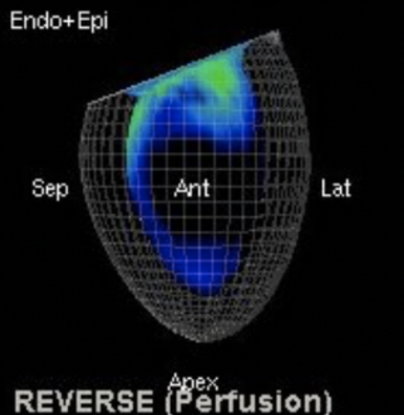


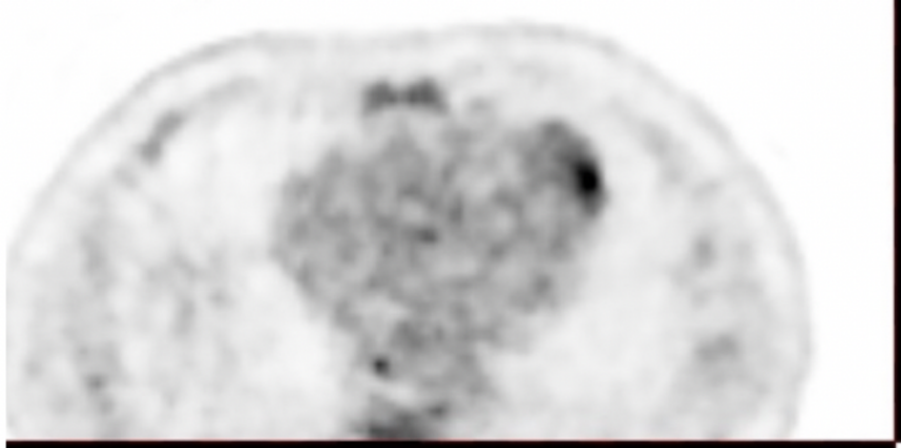


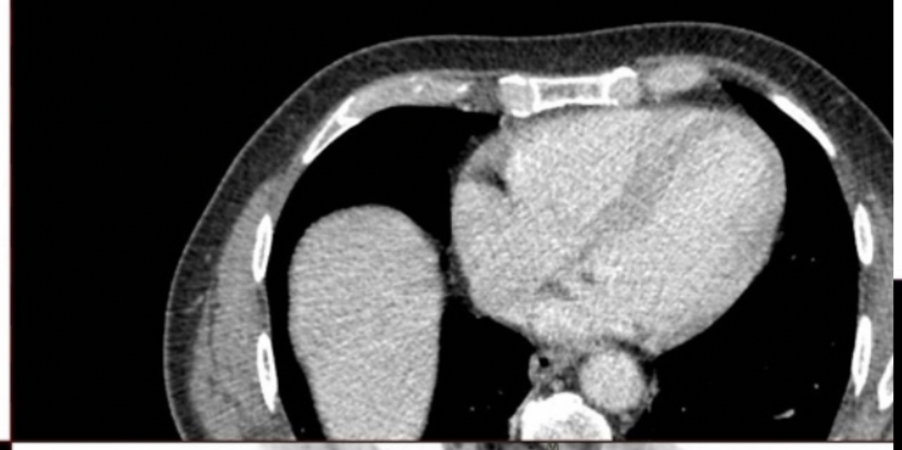


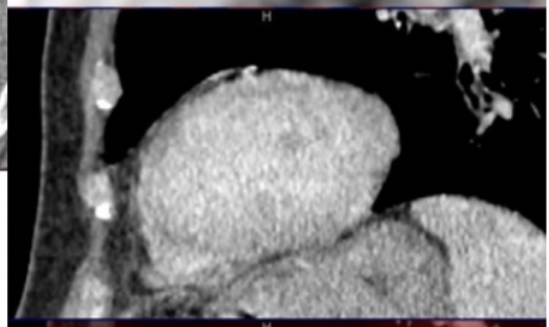


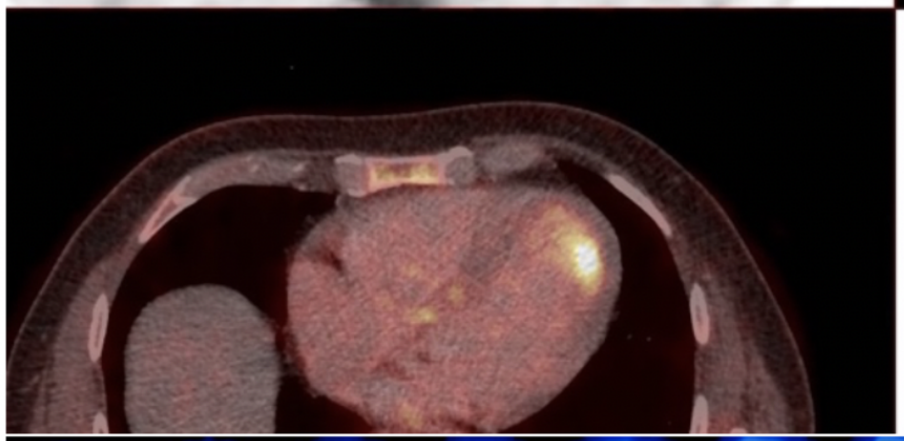


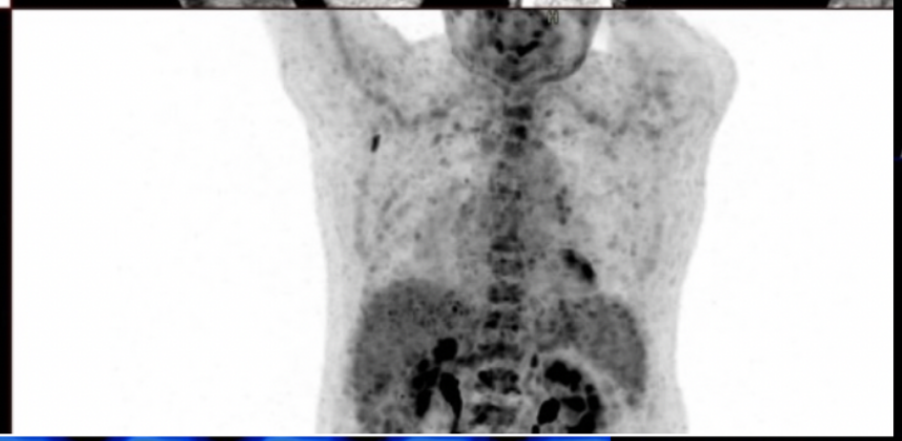


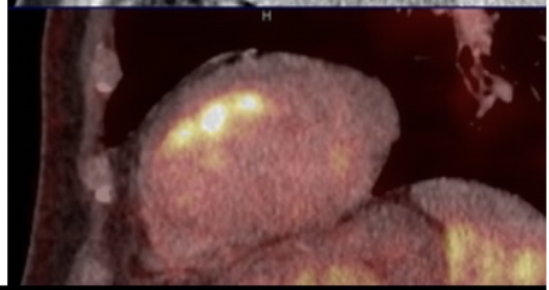


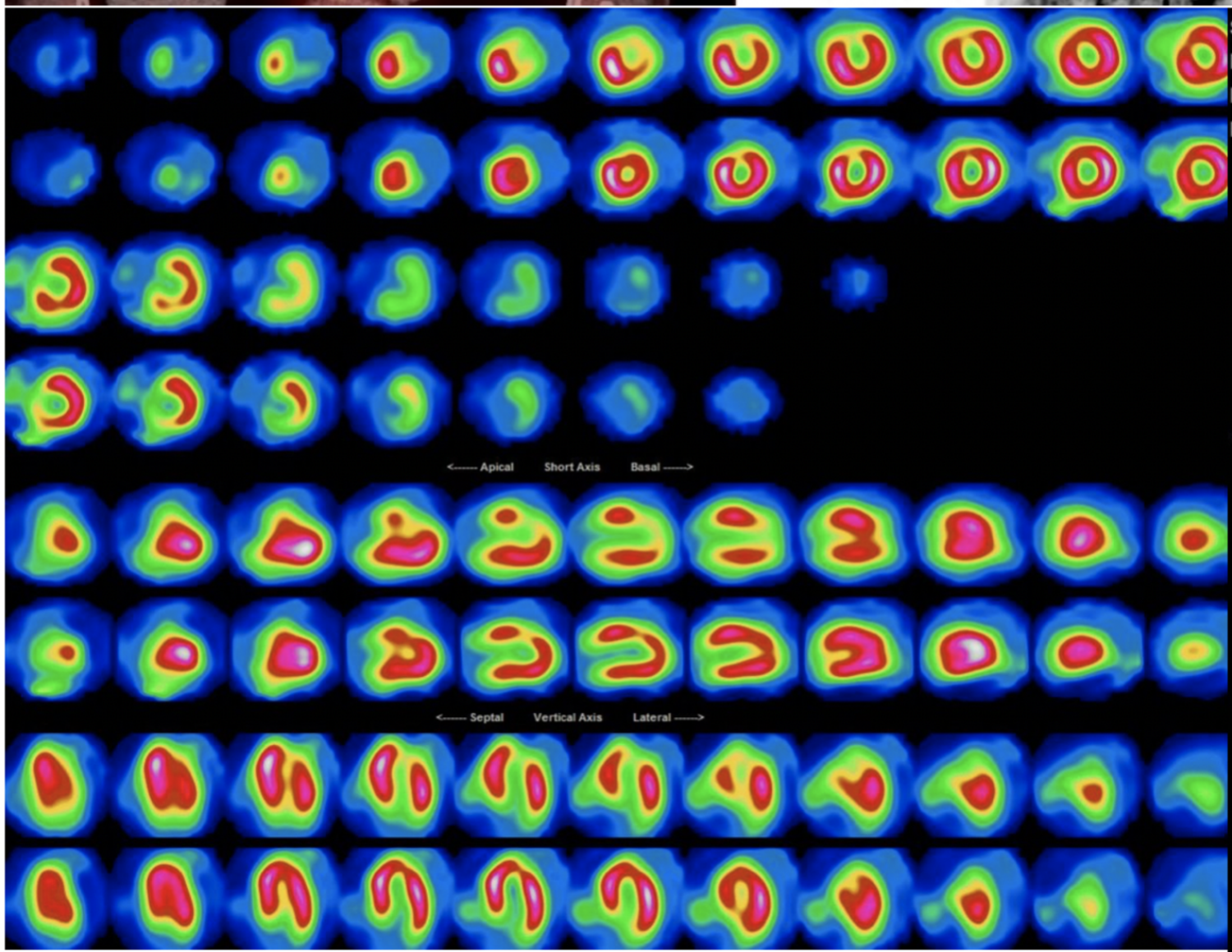






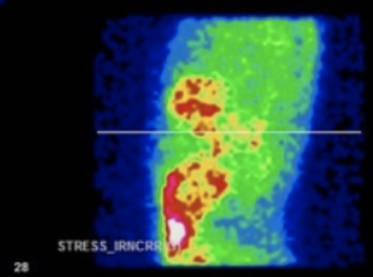


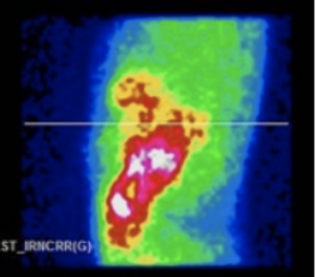


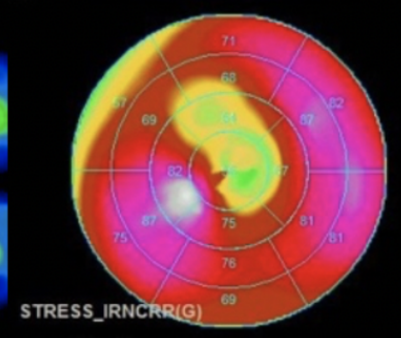


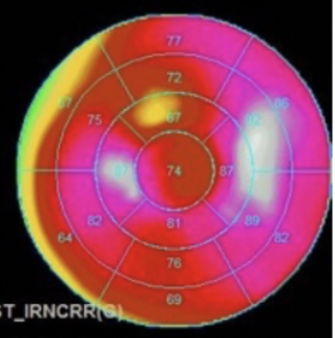
STRESS_IRNCRR(G)
EF: 77%
EDV: 55ml
ESV: 13ml

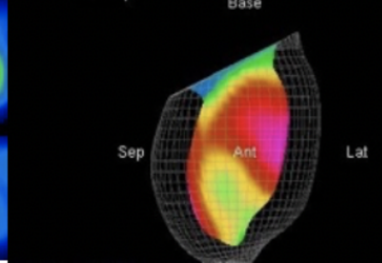
REST_IRNCRR(G)
EF: 81%
EDV: 48ml
ESV: 9ml

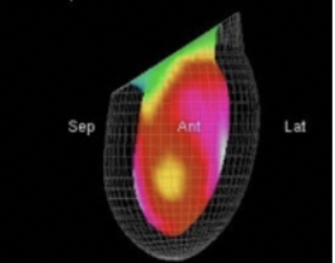


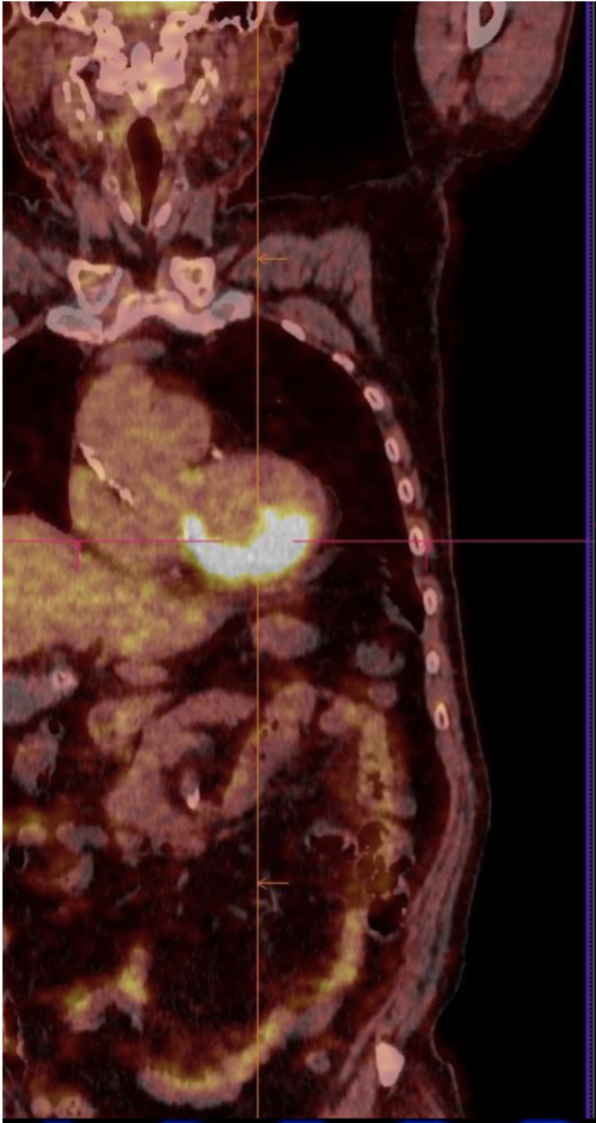


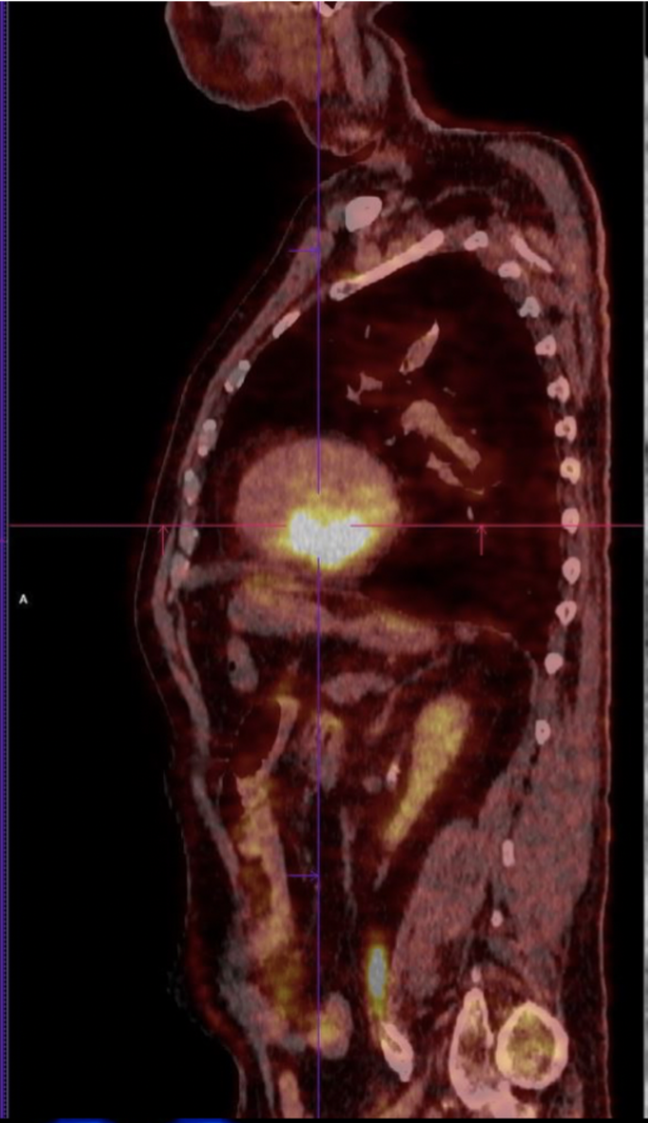


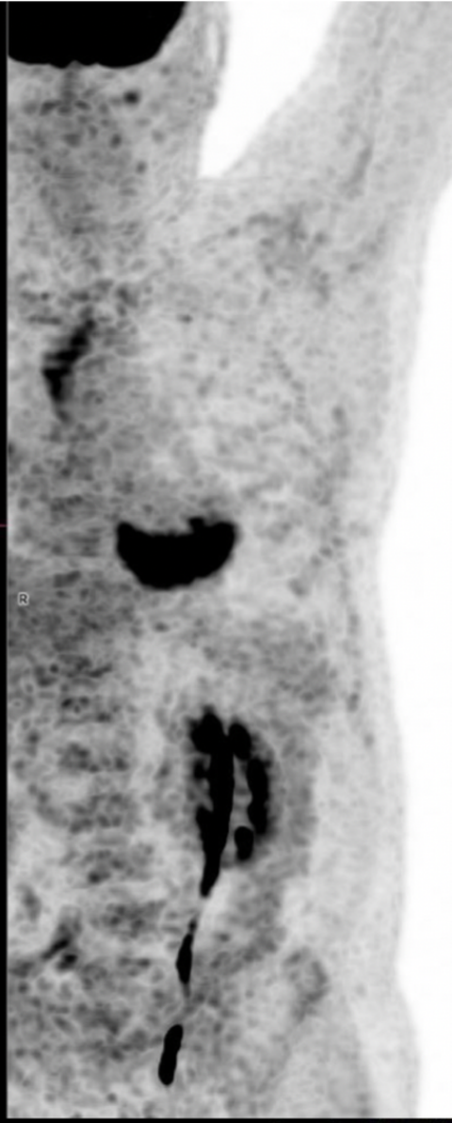




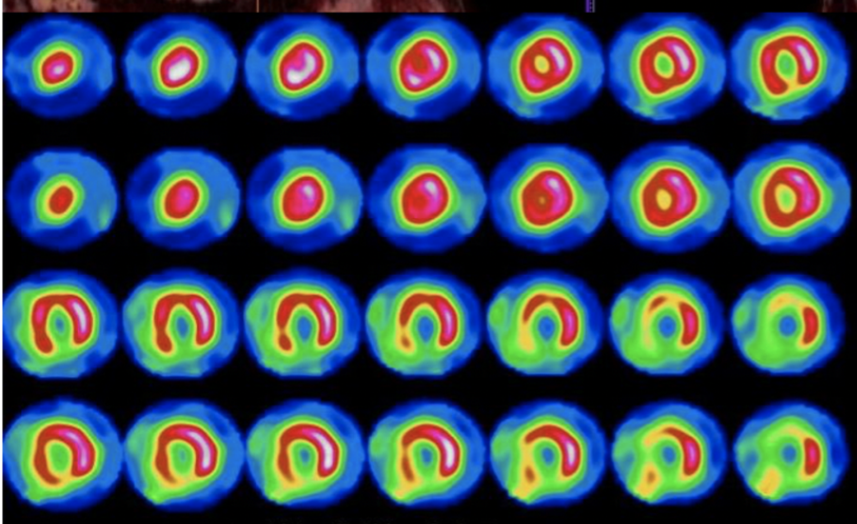






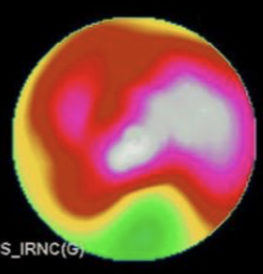


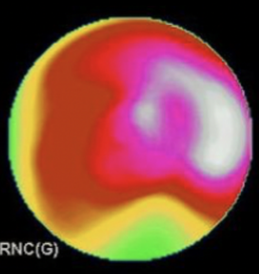
ScreenCap (Myometrix)

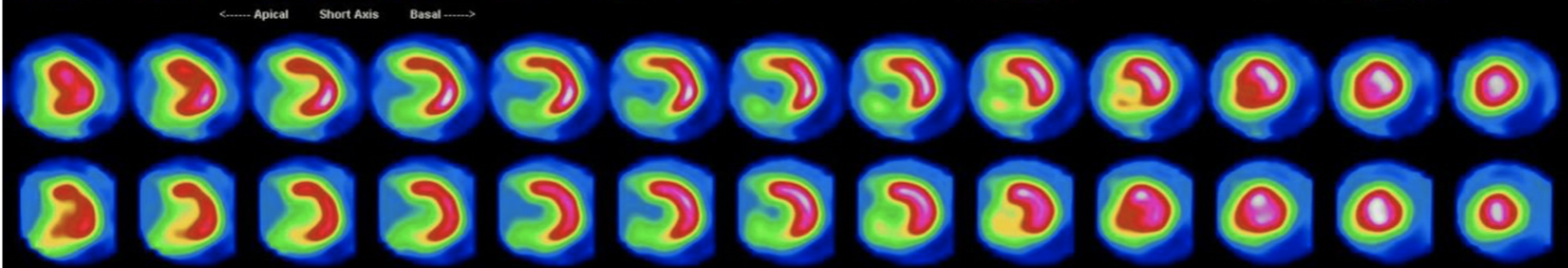


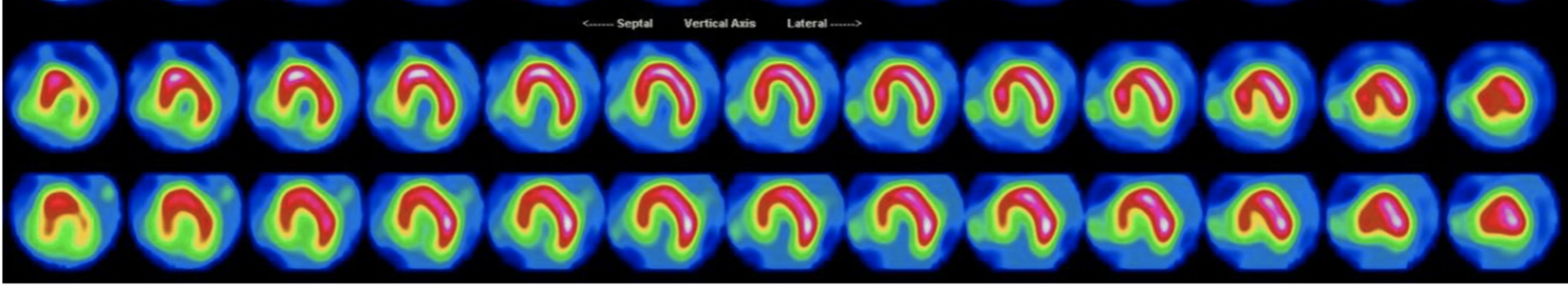
STRESS_IRNC(G)
Date: 2017/05/03 11:25
SA Pixel Size: 4.00mm
SA Thickness: 4.00mm
Recon: OSEM/Bw/0.37/7

REST_IRNC(G)
Date: 2017/05/03 10:04
SA Pixel Size: 4.00mm
SA Thickness: 4.00mm
Recon: OSEM/Bw/0.37/7









Characteristics and cardiovascular risk factors	Value
Age (years, mean ± SD)	63 ± 12
Male, *n* (%)	24 (71)
Female, *n* (%)	10 (29)
Body mass index (kg/cm^2, mean ± SD)	27 ± 5
Clinical indication of ^{18}FDG PET/CT	
-Oncologic diseases	29
-Non oncologic diseases (inflammatory diseases, infectious diseases)	5
Men older than 45 years, *n* (%)	21 (62)
Women older than 55 years, *n* (%)	9 (26)
Active smoking or cessation <1 year ago, *n* (%)	15 (44)
Arterial hypertension (≥140/90 mmHg or antihypertensive medication), *n* (%)	16 (47)
Dyslipidemia (LDL ≥130 mg/dL or HDL <40 mg/dL or medication)	10 (29)
Body mass index ≥30 (kg/cm2), *n* (%)	9 (26)
Type 1 or type 2 diabetes, *n* (%)	7 (21)
Personal history of cardiovascular disease (stroke, arteriopathy of the lower limbs, coronaropathy) *n* (%)	12 (35)
Number of cardiovascular risk factors, *n* (%)	
Zero	1 (3)
One	7 (21)
Two	6 (18)
Three	8 (23)
Four	8 (23)
Five	2 (6)
Six	2 (6)