

## Background

Atherosclerosis is recognized as a diffuse chronic multisystem inflammatory disease. The determination of the unstable plaque is important for risk stratification for major cardiovascular events. Increased metabolism in a atherosclerotic plaque in PET/CT scan with <sup>18</sup>F-FDG. is associated with increased angiogenesis and inflammation mechanisms and could be related to unstable plaque.

## Objetives

The aim of this paper is to describe the cases with incidental findings of vulnerable atherosclerotic plaque in <sup>18</sup>F-FDG. PET/CT scan until the date.

## Methods

Within 1360 <sup>18</sup>F-FDG. PET/CT scan performed between June 2012 to February 2015, a total six patients evidenced incidental findings of vulnerable atherosclerotic. One case was remited with diagnosis of fever of unknown origin; the rest were oncological patients. The PET/CT studies were performed in a hybrid computer - BIOGRAPH mCT128 SIEMENS (Siemens , Germany) previous intravenous administration of <sup>18</sup>F-FDG., with qualitative and semiquantitative evaluation. We report the most relevant cases with incidental finding of vulnerable atherosclerotic plaque to rupture.

## Afiliactions

<sup>1,2</sup>Nuclear Medicine Unit of Fundación Valle del Lili, Cali, Colombia

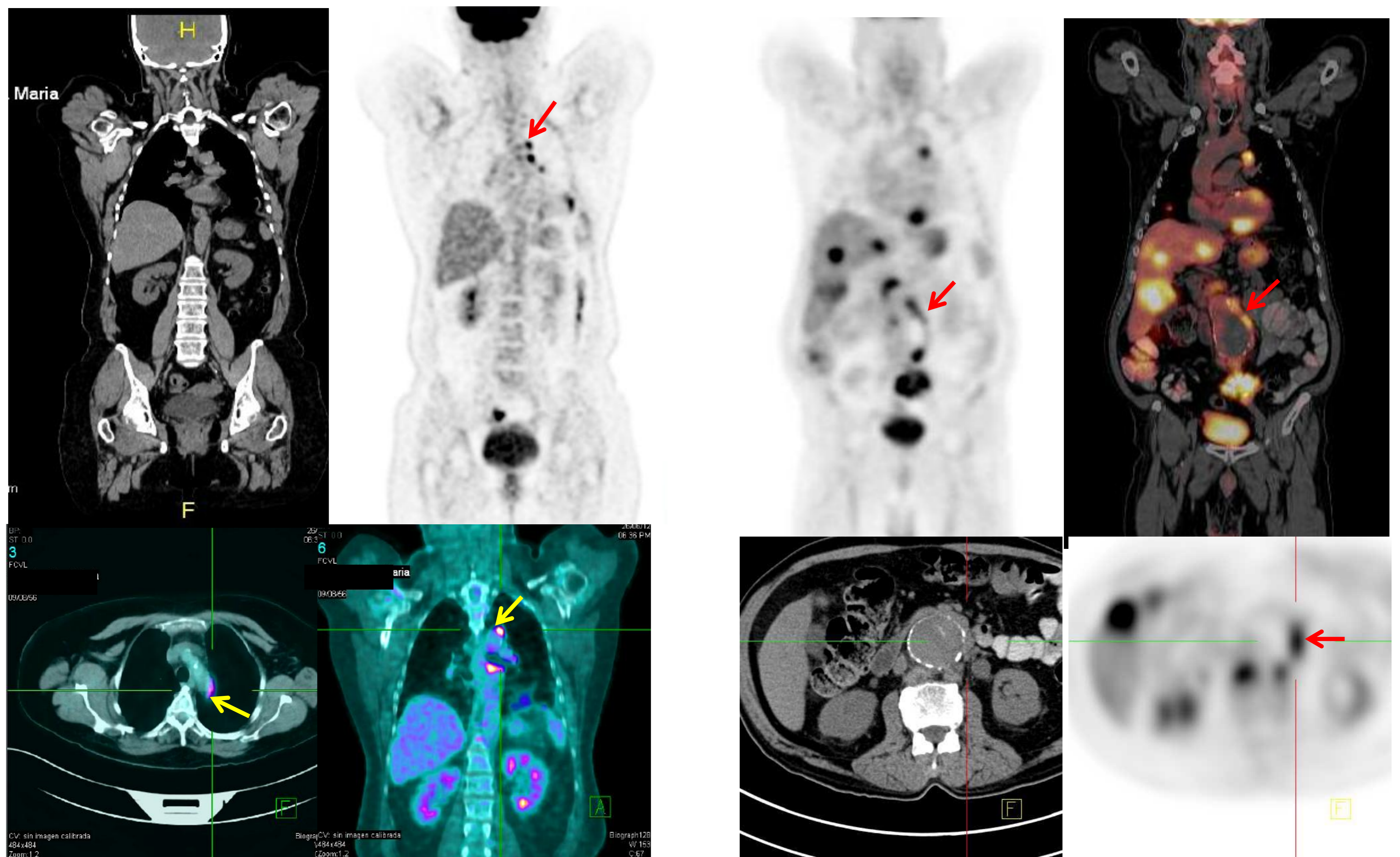
<sup>3-7</sup> Diagnostic Imaging of Fundación Valle del Lili, Cali, Colombia .

<sup>8</sup>. Cardiology Unit . Fundación Valle del Lili, Cali, Colombia .

<sup>9</sup>Clinical Research Center of Fundacion Valle de Lili, Cali. Colombia

## Results

Reviewing the medical literature, major cardiovascular events are associated with plaque rupture. The inflammatory cell content of the plaque is the most important factor for its rupture. The inflammatory cells, especially macrophages, destroy the fibrous layer that protects the atheromatous plaque, exposing the thrombogenic contents to circulation. The macrophages on the atheromas plaques will uptake the <sup>18</sup>F-FDG. The proposed theory is the accumulation of oxidized lipids (necrotic lipid layer) in the vessel wall will trigger an inflammatory response in the intima layer. The balance of inflammatory cells (macrophages and lymphocytes) are crucial to the stability of the plaque; the plaque rupture may occur as clinical and subclinical; with a final consequence of cell death: apoptosis.



Case 1: Woman, 56 years old with Ca poorly differentiated squamous of Lung 2012 and pleura metastases Cardiovascular factors smoking, HTA. Hypermetabolism in aortic arch wall. SUV max 12g/ml

Case 2 : man 70 years old with colon carcinoma, in monitoring tumor marker elevation. PET / CT evidenced metastasis to liver, lung, mediastinum, peritoneal implants and hypermetabolism in left of abdominal aorta wall, associated with aneurysmal dilatation. SUV max 6 g/ml

## Conclusion

The <sup>18</sup>F-FDG. PET/CT scan can identify the vulnerable atherosclerotic plaque and quantify the degree of inflammation.

A prospective study with a multidisciplinary team is required to validate this results and define risk stratification protocols for cardiovascular events

## Bibliography

- Leon J. Menezes .Et al Investigating Vulnerable Atheroma Using Combined 18F-FDG PET/CT Angiography of Carotid Plaque with Immuno histochemical Validation. J Nucl Med 2011; 52:1698–1703
- Luigi Giusto Spagnoli. Et Al. Role of Inflammation in Atherosclerosis. J Nucl Med 2007; 48:1800–1815
- Peter L. Weissberg ,Noninvasive Imaging of Atherosclerosis: The Biology Behind the Pictures The Journal Of Nuclear Medicine, Vol. 45 .No. 11 . November 2004
- H. William Strauss. Imaging the Vulnerable Plaque: A Scintillating Light at the End of the Tunnel? The journal of nuclear medicine.Vol. 45 .No. 7 .July 2004.
- Wykrzykowska et. Al . Imaging of Inflamed and Vulnerable Plaque in Coronary Arteries with 18F-FDG PET/CT in Patients with Suppression of Myocardial Uptake Using a Low-Carbohydrate, High-Fat Preparation. J Nucl Med 2009; 50:563–568
- Josef J. Fox H. William Strauss . One Step Closer to Imaging Vulnerable Plaque in the Coronary Arteries. The Journal Of Nuclear Medicine . Vol. 50 . No. 4 . April 2009
- Mehran M. Sadeghi, Multimodality Molecular Imaging of the Cardiovascular System Imaging Atherosclerosis and Vulnerable Plaque J Nucl Med May 2010 51:51S-65S
- Vancraeynest D, et.aL . Imaging the vulnerable plaque. J Am Coll Cardiol. 2011;57:1961–1979. Tawakol Aet al. In vivo 18Ffluorodeoxyglucose positron emission tomography imaging provides a non-invasive measure of carotid plaque inflammation in patients. J Am Coll Cardiol. 2006;48:1818–1824.