



SISTEMA SANITARIO REGIONALE

AZIENDA OSPEDALIERO-UNIVERSITARIA
SANT'ANDREA



REGIONE
LAZIO



SAPIENZA
UNIVERSITÀ DI ROMA

MEETING

02.07.2021

Dott.ssa Carlotta Rucci - Diagnostic Radiology Resident
Department of Radiological Sciences
University of Rome "Sapienza"
Sant'Andrea University Hospital

CASE PRESENTATION

- Male, 63y
- Hypertension, diabetes, and dyslipidaemia
- Non-diagnostic stress-ECG
- Coronary Computed Tomography Angiography (CCTA)



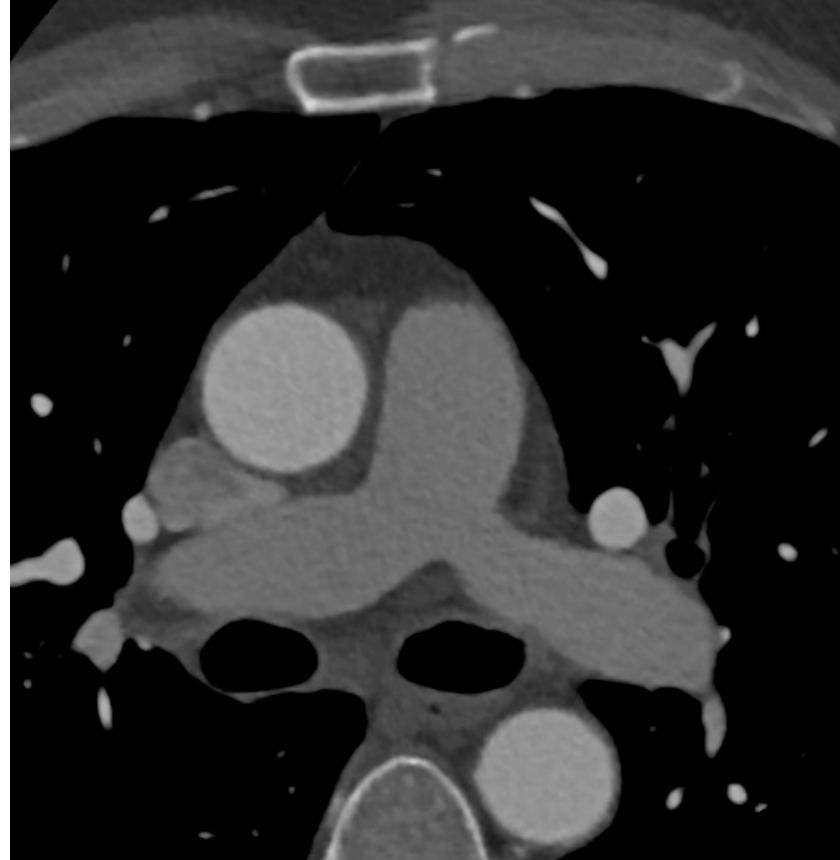
CT ACQUISITION

- Philips Brilliance iCT 256
- Retrospective ECG-gated
- CM: Iopromide 370 mg/ml, 60ml
- Flow rate: 5.0ml/s
- HB: 61bpm (no beta-blocker)
- Natispray administration





CT IMAGES





Coronary Computed Tomography Angiography (CCTA) REPORT

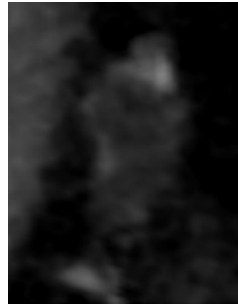
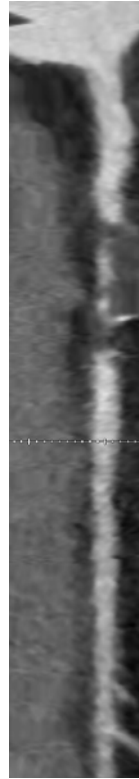
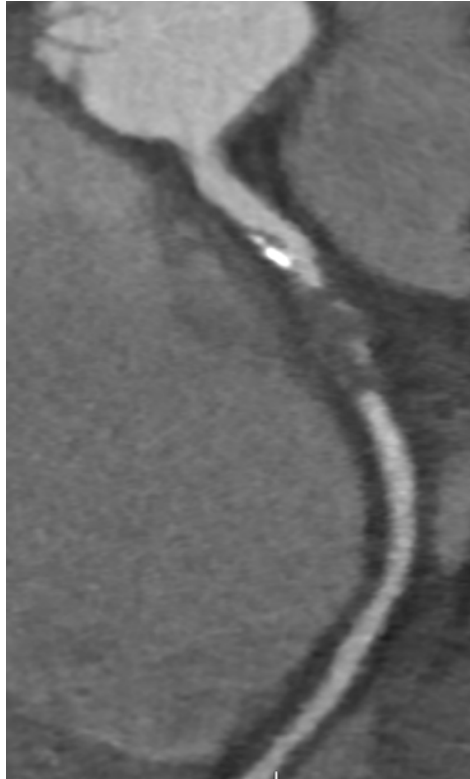
Tronco Comune: Ateromasico esente da stenosi significativa.

Arteria Discendente Anteriore: vaso pervio con alcune placche calcifiche eccentriche non significative al tratto prossimale e medio.

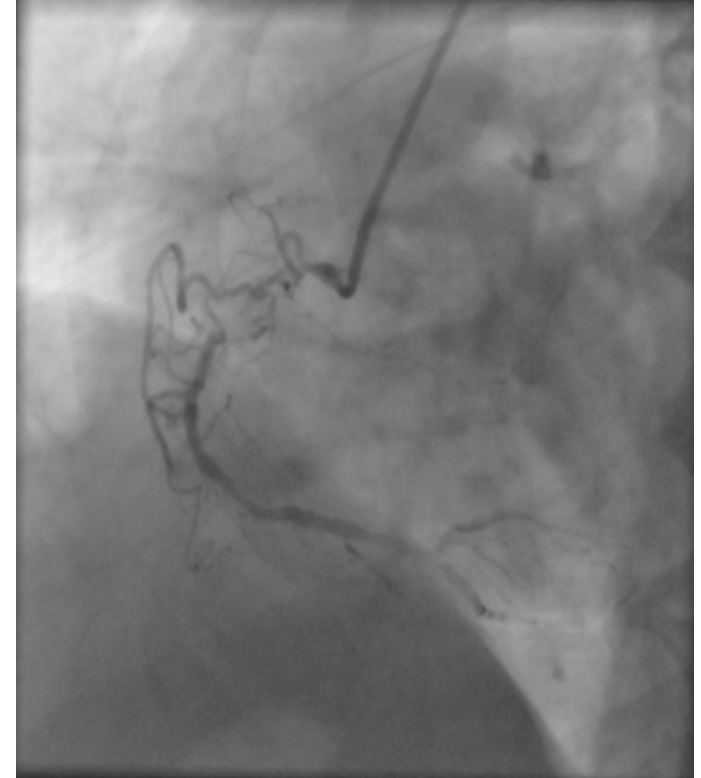
Arteria Circonflessa: ...di buon calibro; al passaggio prossimale-medio placca fibro-lipidica non significativa.

Arteria Coronaria Destra: ..al tratto medio occlusione del lume estesa per circa 19mm sostenuta da apposizione fibro-lipidica determinante un marcato rimodellamento positivo del vaso (DM 8mm).

RCA

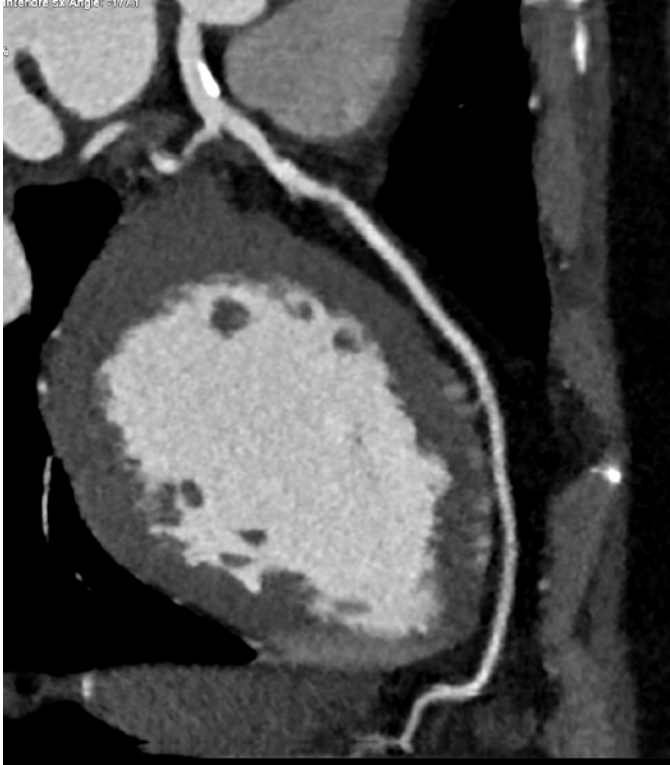


Reformatted

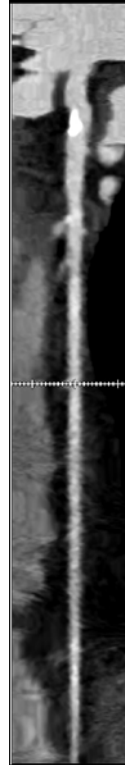


Coronarography

LAD

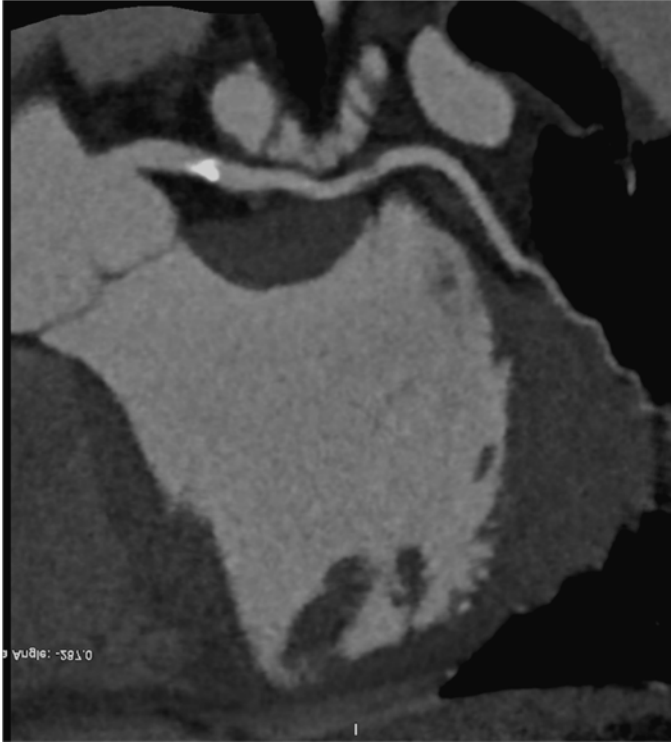


Reformatted

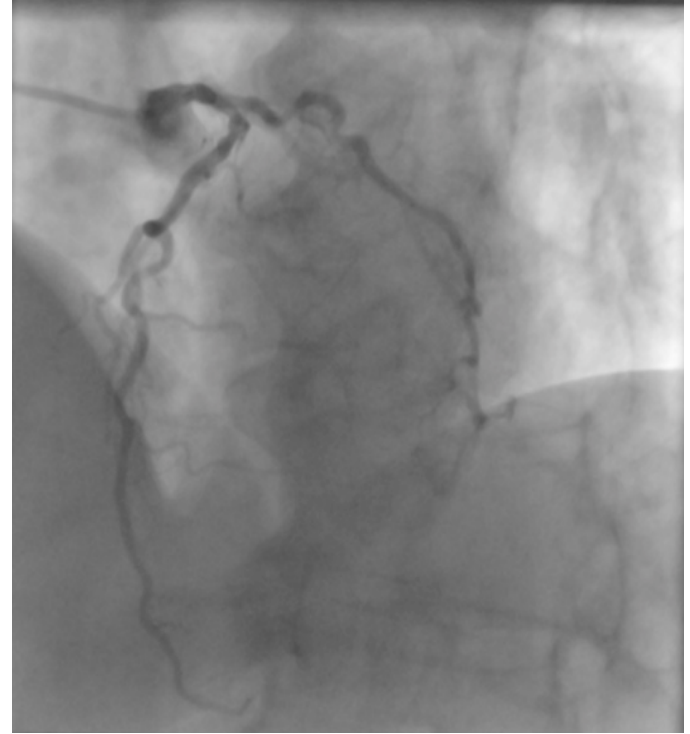
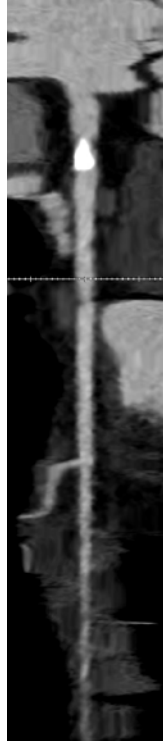


Coronarography

LCX



Reformatted



Coronarography



Coronary Angiography REPORT

Tronco Comune: Calcifico ed Ateromasico esente da stenosi significative.

Arteria Discendente Anteriore: Calcifica, diffusamente ateromasica, in assenza di stenosi significativa

Arteria Circonflessa: Calcifica ed Ateromasica in assenza di stenosi significativa.

Arteria Coronaria Destra: Dominante di buon calibro, occlusione cronica del tratto medio con opacizzazione a valle di un circolo collaterale omocoronarico.

Coronary Artery Disease (CAD)

- Most common type of heart disease.
- Atherosclerotic plaques are the major cause of CAD.





Coronary Computed Tomography Angiography (CCTA)

- CCTA most commonly imaging technique in the diagnosis and management of CAD
- Negative predictive value (>90%)
- Included in international guidelines (European Society of Cardiology [ESC] as a Class I recommendation (LoE B)



CCTA has demonstrated that some specific plaque features are linked to plaque progression and vulnerability:

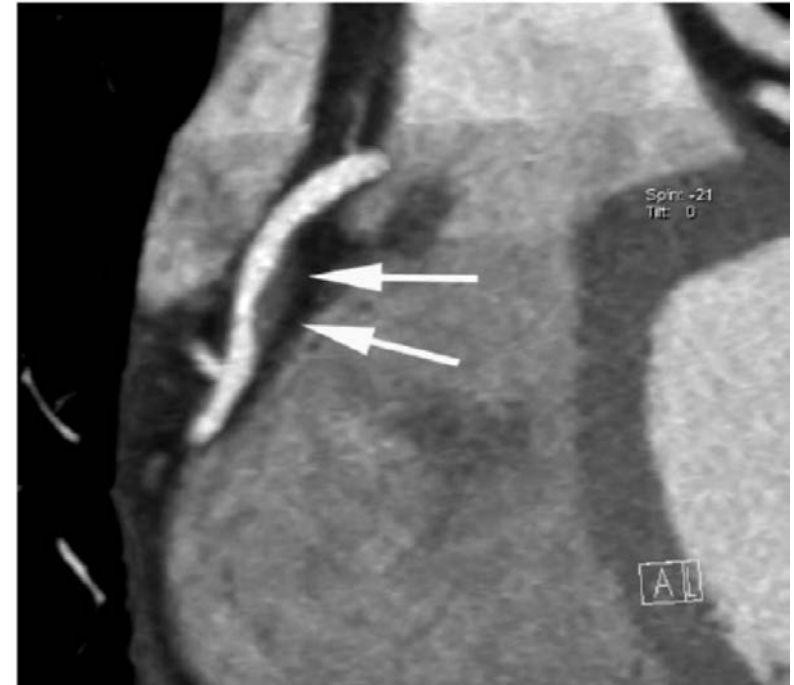
- Attenuation plaque
- Spotty calcification
- Positive remodelling
- The napkin ring sign



ATTENUATION PLAQUE

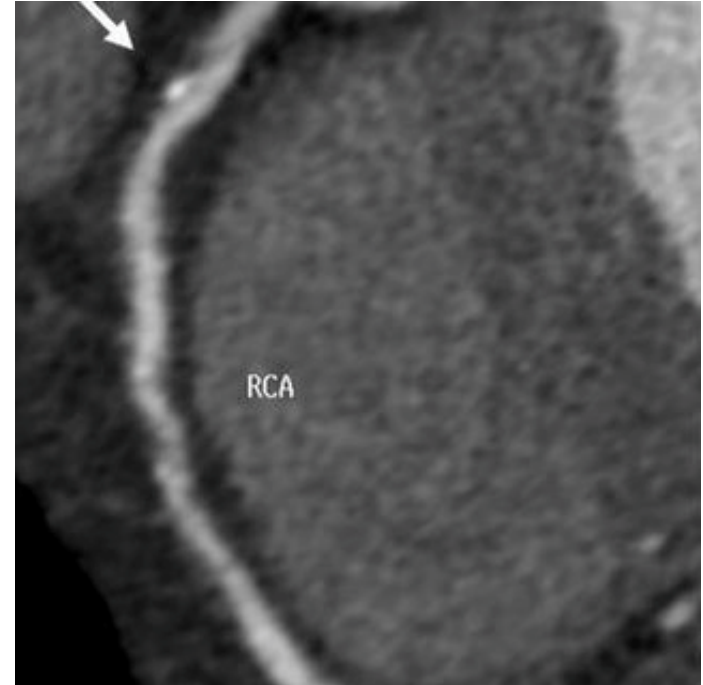
- Several studies have proved CT to be useful for distinction between lipid-rich, fibrous, and calcified plaques.
- CT-density values characterized by Hounsfield Units (HU) may classify non-calcified plaques as fibrous or lipid-rich, however a well defined cut-off values have not yet been established.
- Schroeder et al. have suggested these specific cutoff values: lipid-rich plaque ≤ 60 HU, fibrous plaque 60–119 HU, and calcified plaque ≥ 120 HU.

ATTENUATION PLAQUE



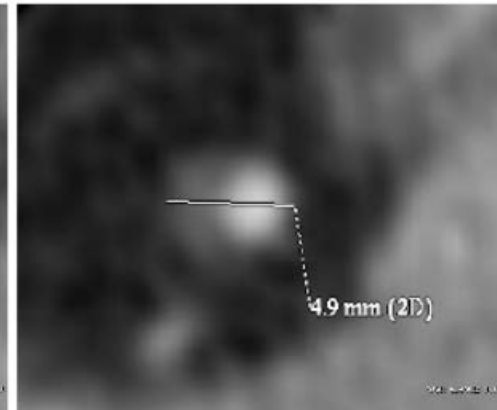
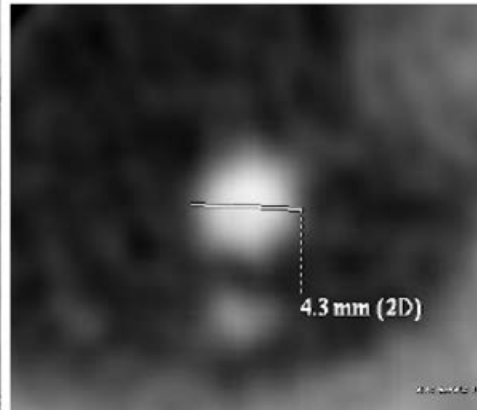
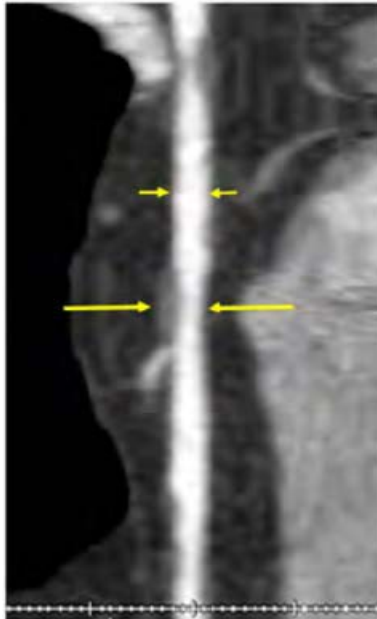
SPOTTY CALCIFICATION

- Small calcified foci in the range between 1 and 3 mm embedded in a noncalcified plaque are categorized as spotty calcification



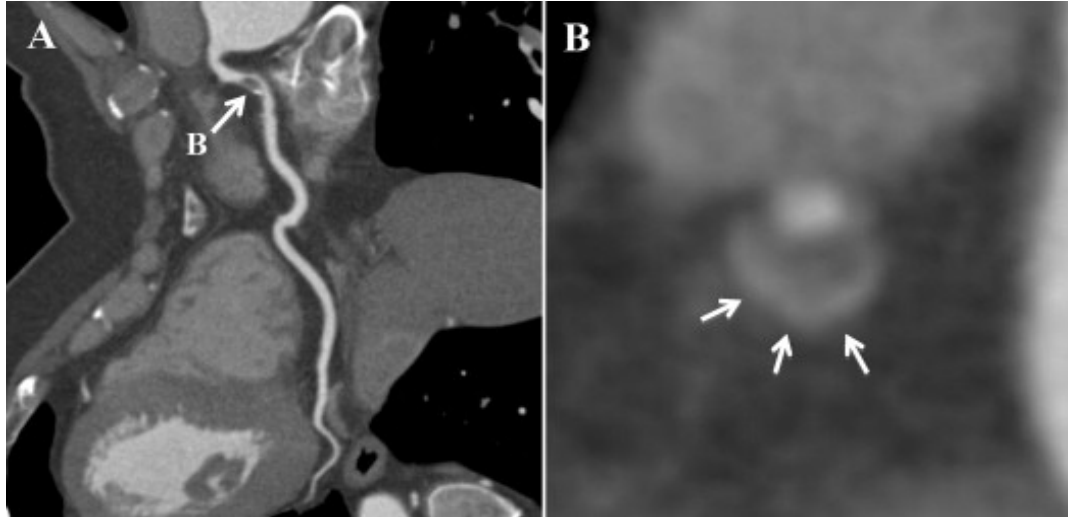
POSITIVE REMODELING

- It is defined as a 5-10% difference in luminal diameter in a coronary artery



NAPKIN RING SIGN (NRS)

- Defined as a plaque cross-section with a central area of low CT attenuation apparently in contact with the lumen, which is surrounded by a ring-shaped higher attenuation plaque tissue





TAKE HOME MESSAGES

- The CCTA can recognize the degree of stenosis of a plaque and the specific vulnerability characteristics
- Negative predictive value (>90%)



Characteristics of high-risk coronary plaques identified by computed tomographic angiography and associated prognosis: a systematic review and meta-analysis

Camilla Thomsen* and Jawdat Abdulla

Division of Cardiology, Department of Medicine, Glostrup University Hospital, Nordre Ringvej 57, 2600 Glostrup, Copenhagen, Denmark

Received 7 September 2015; accepted after revision 16 November 2015

Invited Commentary for The Journal of Cardiovascular Computed Tomography (JCCT)

Plaque assessment by coronary CT

Bálint Szilveszter¹ · Csilla Celeng¹ · Pál Maurovich-Horvat¹

Plaques, Stenosis and Subtended Myocardial Mass:

CT Crosses the Bridge from Morphology to Function

Coronary Plaque Characterization Using CT

Farhood Saremi¹
Stephan Achenbach²

OBJECTIVE. In this article, we review the histopathologic classification of coronary atherosclerotic plaques and describe the possibilities and limitations of CT regarding the evaluation of coronary artery plaques.

THANKS

