Infrainguinal Artery Calcification in Fem/Pop & Tibial Arteries: What is its Location and Nature and How Does it Impact on Endovascular Treatments in the Thigh, Leg and Foot

J.A. Mustapha, MD, FACC, FSCAI
Director of Cardiovascular Catheterization Laboratories
Director of Endovascular Interventions
Director of Cardiovascular Research
Metro Health Hospital – Wyoming, MI

Disclosures

Consultant:
• Abbott Vascular
• Bard Peripheral Vascular
• Boston Scientific
• Cardiovascular Systems, Inc.
• Cook Medical
• Cordis
• Medtronic
• Spectranetics
• Terumo Medical

CLI and Calcification

• Pre-clinical factors that increase the suspicion of increased calcium presence
• Methods of calcific evaluations
• Intra-procedural factors that determine the depth of calcification

Myth vs Fact

• Fact: calcium deposit is two types
  – Type one: intimal calcification
  – Type two: medial calcification

• Myth: all calcium deposit is non structured and sporadic with the same densities.

Fact: Medial calcification deposit in the medial wall is organized and structured in crescent shapes.
Myth vs Fact
Fact: Intimal calcification deposit in the intima and plaque is disorganized and not structured

Scattered disorganized Intimal calcification

Based on original work by JA Mustapha & Renu Virmani

Myth vs Fact
• Fact: Mixed intimal and medial calcification is usually separated with each confined to its quarter
• In severe cases, intimal calcification invades the medial wall and mixes with it
• On rare occasion, intimal and medial calcification extends into the adventitia

Based on original work by JA Mustapha & Renu Virmani

Key hints to differentiate medial from intimal calcifications

Preclinical and clinical value of the two different calcium deposit types
• The knowledge of the presence of one or both calcium types prepares operators to have a more structured approach
• Suspicion of calcium presence/deposit should be high in patients with increased age, DM, CKD, and PVD/CLI

Preclinical and clinical value of the two different calcium deposit

There is higher association of medial calcification in patients with:
1- CLI RF IV - IV
2- CKD
3- Type 1 DM and long term Type 2 DM

Based on original work by JA Mustapha & Renu Virmani
Crescent shape medial calcification

Medial calcification is similar to intimal calcification with its variable Densities. Notice the variable densities.

3D Reconstruction CT (no contrast) of Calcified SFA

IVUS

Disarrayed and disorganized

Intimal calcification
Acoustic shadowing: yellow arrows shows the Drop out caused by the dense intimal calcification

Medial calcification not causing acoustic shadowing
And the vessel wall is well visualized

Crescent and organized

Popliteal

Calcium Macroevaluation

87 y/o female without h/o clinical PAD

History of COPD, smoking, MI, CHF
Faxitron and high resolution x-ray

CT without contrast

CT 3D reconstructed

(Tibial) 3DCT reconstructed

Calcium microhistology

CV32728
R SFA 20 to

Nodular Calcification
CTOs come in all different forms.
Thank You

J.A. Mustapha, MD, FACC, FSCAI
Director of Cardiovascular Catheterization Laboratories
Director of Endovascular Interventions
Director of Cardiovascular Research
Metro Health Hospital – Wyoming, MI