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# Patterns of Calcification in BTK Arteries

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The logo for LINC (Limb Inflow and Outflow) is located in the top left corner. It features the letters 'LINC' in a white, sans-serif font, positioned over a stylized graphic of a curved, brush-stroke-like shape in shades of blue, red, and yellow.

LINC

# First-in-man experience with the MOTIV Bioresorbable scaffold in below-the-knee arteries

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Director: Prof. G. Torsello

# Disclosure

Speaker name: Jihad A. Mustapha

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I have the following potential conflicts of interest to report:

- Bard Peripheral Vascular: Consultant
- Boston Scientific: Consultant, Research
- CardioFlow: Board of Directors, Stock, Research
- Cardiovascular Systems, Inc: Consultant
- Medtronic: Consultant
- Micromedical Solutions: Chief Medical Officer
- Philips: Consultant
- PQ Bypass: Research
- Terumo: Consultant

# Histopathology of Medial Calcification

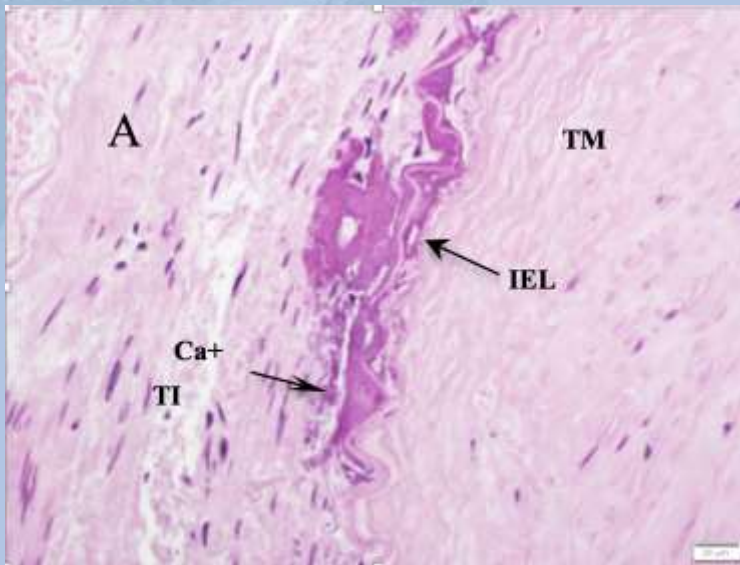
- Calcium deposits were identified by purple irregular deposits in the cytoplasm of the vascular smooth muscle cells (VSMC) or in the extracellular matrix along the VSMCs of the media on H&E stain.

# Histopathology of Medial Calcification

We found multiple patterns of TM calcification & a combination is usually found in the same section. The most common patterns found were:

- A. Diffuse, non-confluent calcification, “dusty” micro calcifications
  - A. “Dusty” calcifications along the Internal Elastic Lamina (IEL) only, early stage (Figure B)
  - B. “dusty” calcification within the thickness of the media (Figure D)
  - C. Combination of the above (Figure A)
- B. Confluent, solid, sheet-like or “lumpy” calcification
  - A. “Lumpy” calcification along the IEL only (Figure C)
  - B. Sheet-like or “lumpy” calcification (Figure E)
  - C. Sheet-like concentric calcification (Figures G and H)
- C. Combinations of A and B
- D. Calcifications accompanied by ossification and / or cartilaginous metaplastic (Fig F)

“Dust” like  
calcification on both  
sides and along IEL

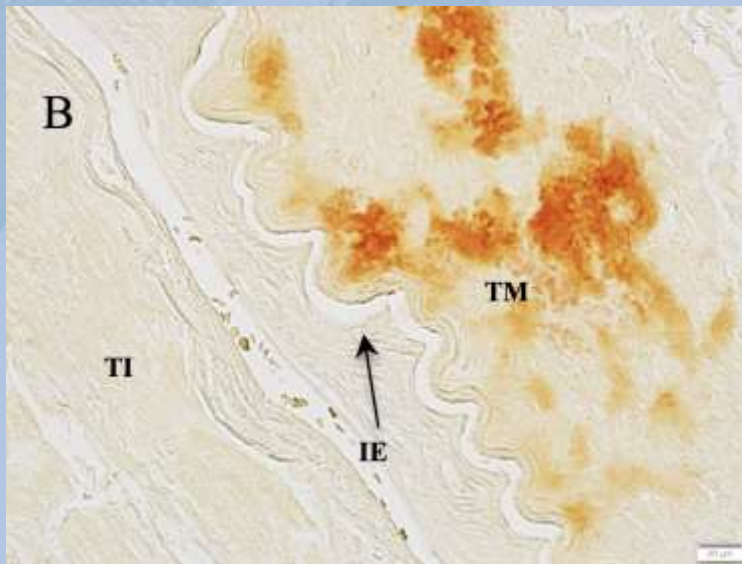


TM=Tunica Medial (medial calcification)

IEL=Internal Elastic Lamina

Ca+=Calcification

TI=Tunica Intima

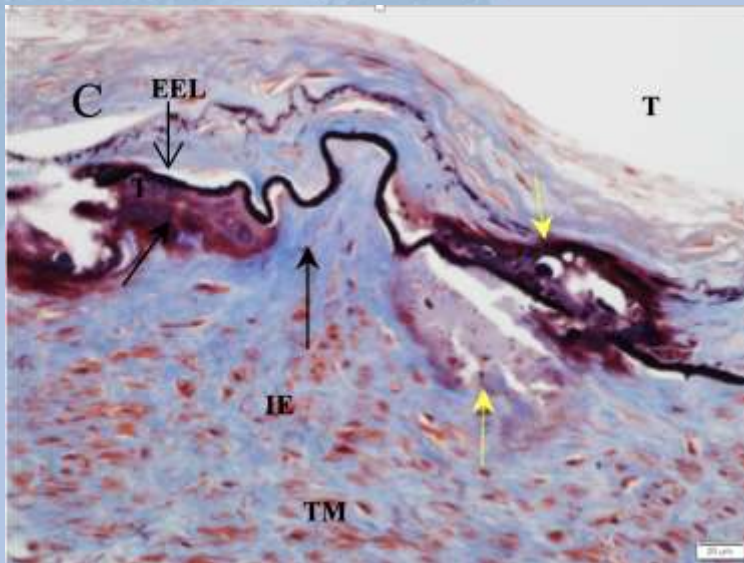


- Medial calcification along IEL (arrows).
- Note: IE becomes a "boundary" to calcification which is localized only in medial calcification.

TM=Tunica Media (medial calcification)

IE=Internal Elastic Lamina

TI=Tunica Intima



- Calcification along IEL on both TI and TM sides. Note: microscopic area of cartilaginous metaplasia (yellow arrows) even in this minor TM calcification.

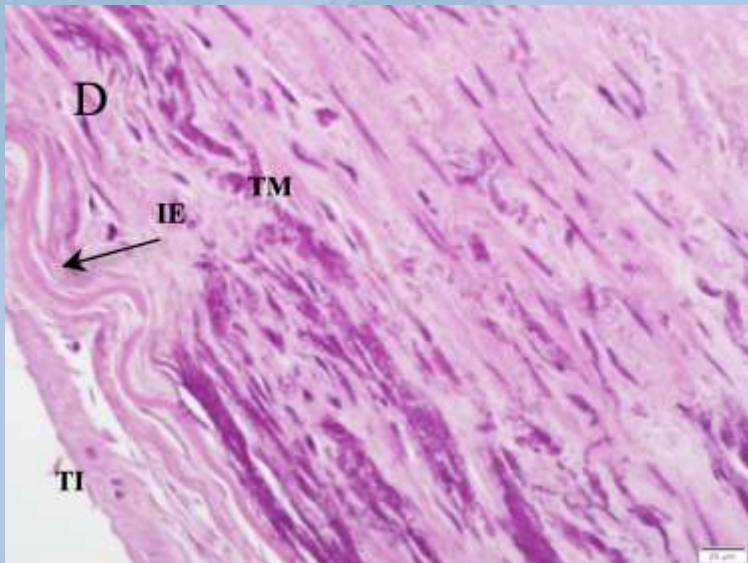
TM=Tunica Medial (medial calcification)

EEL=External Elastic Lamina

IE=Internal Elastic Lamina

TI=Tunica Intima





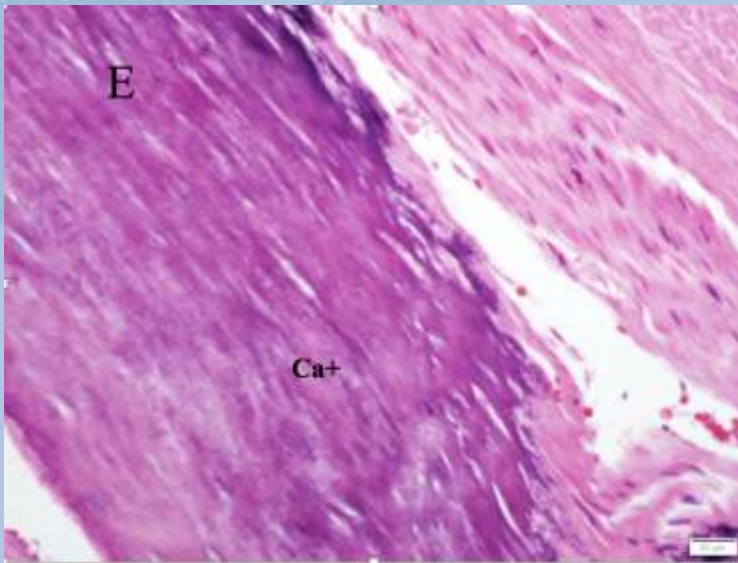
- More confluent calcification, loss of VSMCs orientation in this area.
- Note: IEL is a “boundary” to calcification which is localized only in TM.

TM=Tunica Medial (medial calcification)

IE=Internal Elastic Lamina

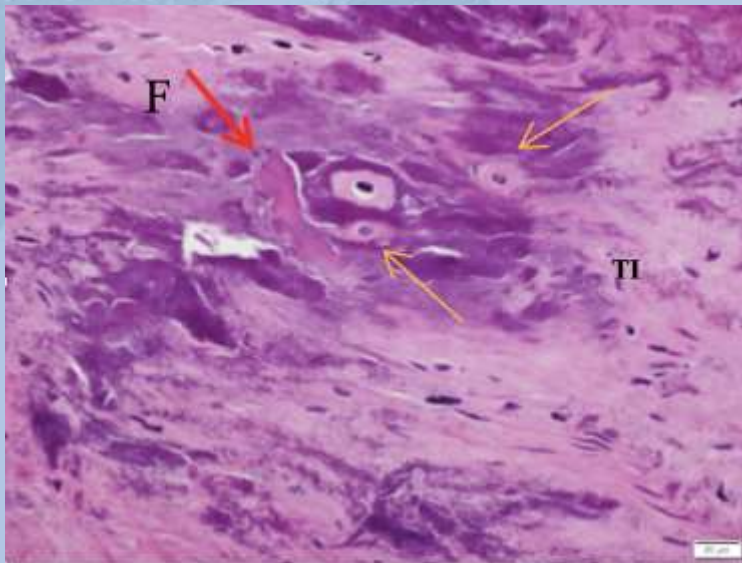
TI=Tunica Intima

VSMC=Vascular Smooth Muscle Cells



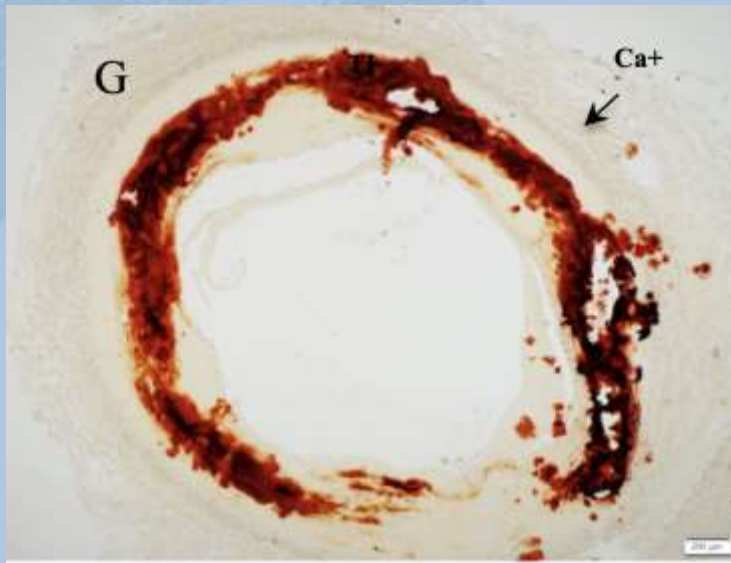
- Complete loss of VSMCs outlines and loss of nuclei
- Area resembles “sheets” of amorphous mineralized matrix, occupying entire thickness on medial calcification
- In the areas of severe calcium depositions, the VSMCs lose their nuclei and their cell boundaries, and become indistinguishable from the surrounding fibrous tissue. Eventually, larger areas of medial calcification become acellular and calcified in a sheet-like fashion.

Ca+=calcification  
VSMC=Vascular Smooth Muscle Cells

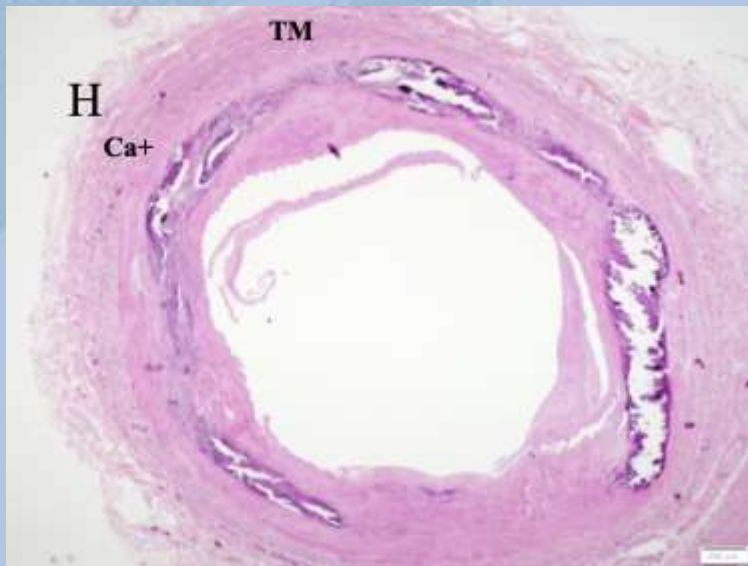


- Confluent and medial calcification with microscopic bone (red arrow) and cartilage metaplasia
- Cartilage tissue contains chondrocytes in the lacunae (yellow arrows)
- In the vicinity of the calcium deposits, even in the earlier “dusty” patterns, the VSMCs demonstrate a haphazard arrangement; lose their elongated shape, transitioning into oval-shaped cells. These cells resemble osteoblasts, and/or chondrocytes and become embedded in medial calcification.

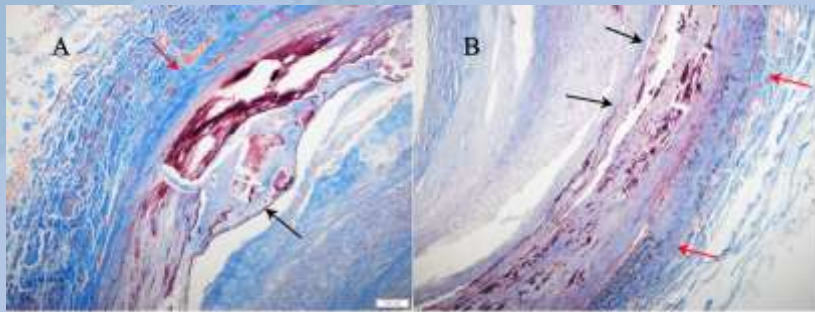
TI = Tunica Intima  
VSMC = vascular smooth muscle cells



- Circumferential medial calcification, minimal neointimal hyperplasia, no tunica media calcification.
- G and H are serial sections.



- Circumferential medial calcification (TM), minimal neointimal hyperplasia, no tunica intima calcification.
- G and H are serial sections.



- In the areas of mild medial calcification IEL shows either no visible changes or different Internal Elastic Laminal (IEL) alterations, the most common being multiplications and disruptions.
- These changes are most often seen on the medial calcification side and rarely on the Tunica Intima (TI) side. In more severe medial calcification, not only the IEL but External Elastic Lamina (EEL) also shows attenuation and disruption (Figure B).
- Unlike calcification in the TI there was no evidence of lipid deposition or inflammatory cellular response to it in the areas of medial calcification. Even in severe ones.



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