

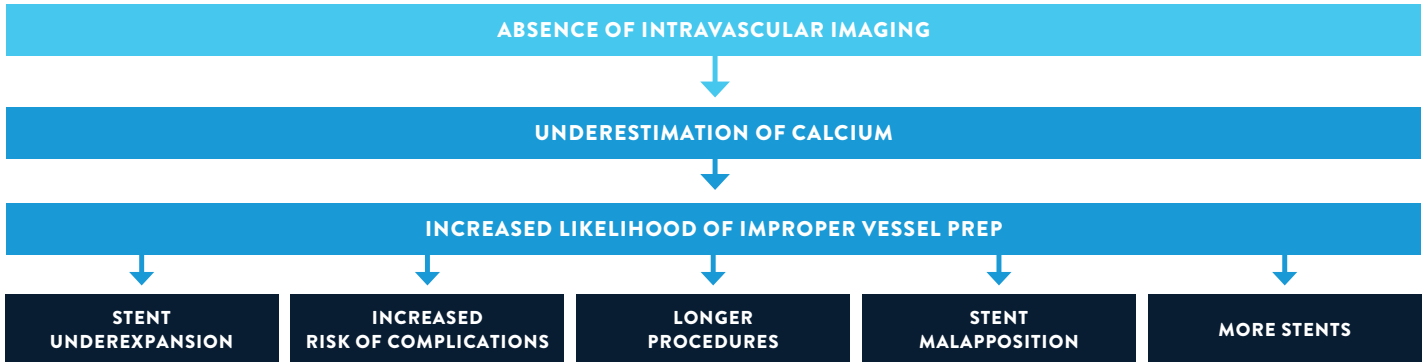


INTRAVASCULAR IMAGING: OPTICAL COHERENCE TOMOGRAPHY (OCT)

HOW TO DIAGNOSE CALCIUM WITH OCT AND DEVELOP
TREATMENT STRATEGIES

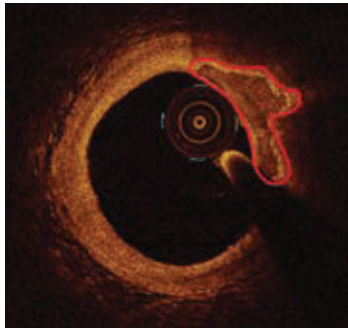
HOW TO DIAGNOSE CALCIUM WITH OCT AND DEVELOP TREATMENT STRATEGIES

The absence of intravascular imaging may lead to underestimation of calcium and improper diagnosis.¹



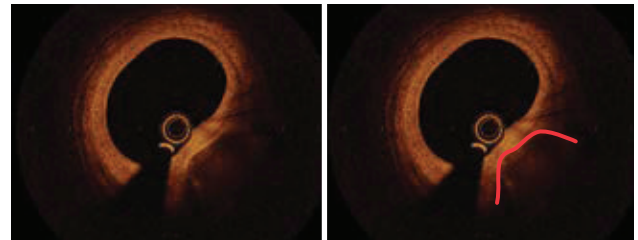
DIAGNOSING CALCIUM WITH OCT

Calcific plaque is characterized as having low attenuation (light penetrates deep, can see tissue) and clear, delineated edges (appear as “islands” or “rocks”). In the image to the right, calcific plaque is observed from 12 o’clock to 3 o’clock.

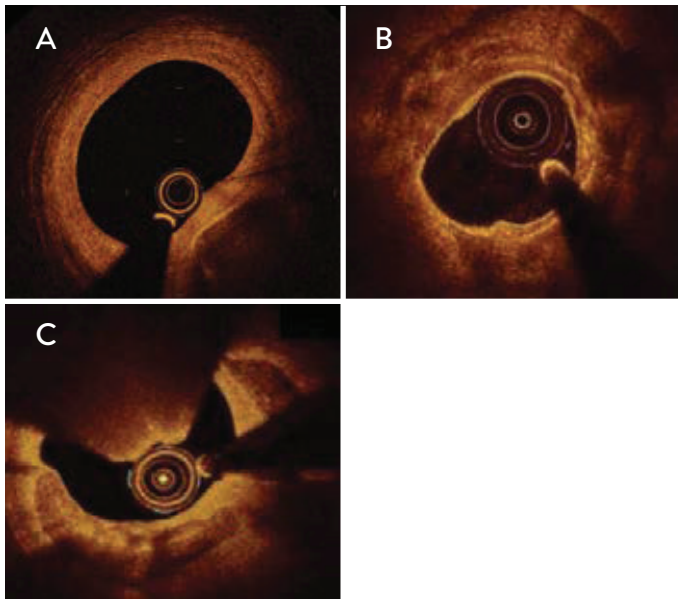


CALCIUM APPEARANCE BY TYPE ON OCT

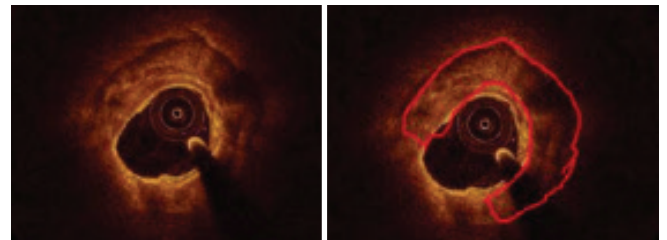
1. Deep calcium appears furthest away from the lumen separated by a thick layer. On the image on the right, deep calcium is shown with the red outline.



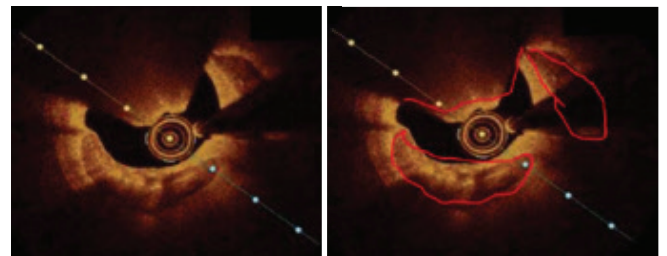
When diagnosing calcific plaque, it’s important to differentiate between (A) deep, (B) superficial and (C) nodular calcium, as seen below, to choose the right treatment strategy.



2. Superficial calcium appears close to the lumen. On the image on the right, superficial calcium is shown with the red outline.



3. Nodular calcium extends into the lumen. On the image on the right, nodular calcium is shown with the red outline.



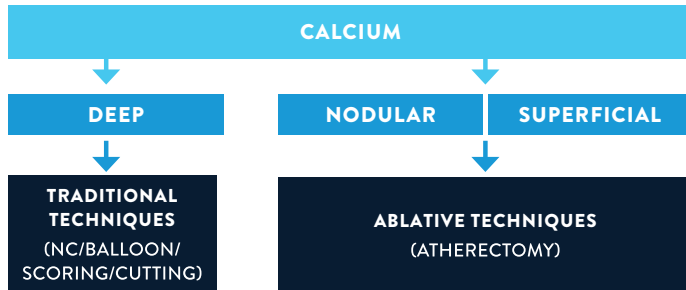
1. Courtesy of Richard Shlofmitz, M.D.

HOW TO DIAGNOSE CALCIUM WITH OCT AND DEVELOP TREATMENT STRATEGIES

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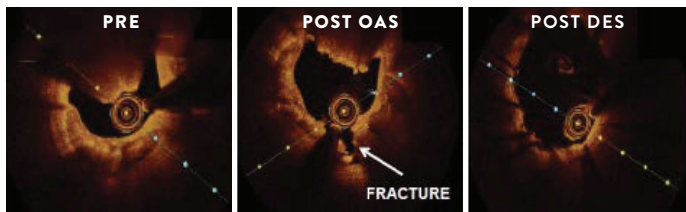
CALCIUM TREATMENT

By accessing the degree of calcium burden, you can identify the right pre-treatment strategy.²



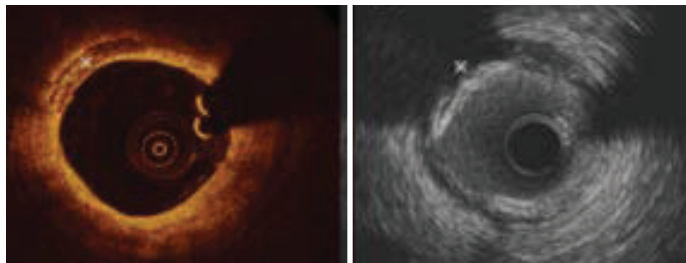
During atherectomy, OCT helps visualize fractures in and the reduction of calcium to guide further treatment decisions.³

CALCIFIED NODULE → ATHERECTOMY → MSA MAXIMIZED



OCT imaging helps you realize the thickness of the calcium as compared to intravascular ultrasound (IVUS). OCT is light based; it penetrates and surrounds calcium. IVUS is sound based; sound waves bounce off the calcium and create a dark shadow, as seen below.⁴

OCT VS. IVUS



Measuring calcium depth with an OCT-based calcium score algorithm can help identify calcific lesions that would benefit from plaque modification before stent implantation.⁵ This algorithm looks at calcium thickness, calcium angle and calcium length. Lesions at risk of stent underexpansion have a calcium score of 4, based on this algorithm.

Thickness > 0.5 mm

Angle > 180°

Length > 5 mm

OCT-BASED CALCIUM SCORE		
1. Maximum calcium angle (°)	≤ 180° →	0 points
	≥ 180° →	2 points
2. Maximum calcium thickness (mm)	≤ 0.5 mm →	0 points
	≥ 0.5 mm →	1 point
3. Calcium length (mm)	≤ 5.0 mm →	0 points
	≥ 5.0 mm →	1 point
Total score	0 to 4 points	

1-2. Courtesy of Richard Shlofmitz, M.D.

3-4. Bezerra, Hiram. Jun 13, 2016. Intravascular OCT in PCI. Retrieved from URL: <https://www.acc.org/latest-in-cardiology/articles/2016/06/13/10/01intravascular-oct-in-pci>.

5. Fujino et al. A new optical coherence tomography-based calcium scoring system to predict stent under-expansion EuroIntervention. 2018 Apr 6;13(18):e2182-e2189. doi: 10.4244/EIJ-D-17-00962.

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Abbott International BVBA

Park Lane, Culliganlaan 2B, 1831 Diegem, Belgium, Tel: 32.2.714.14.11

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