

Intrakoronare Bildgebung – Die Gegenwart und Zukunft von Koronarinterventionen

Fallvorstellungen

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Oberärzte Interventionelle Kardiologie

Intrakoronare Bildgebung

2024 ESC Guidelines for the management of chronic coronary syndromes

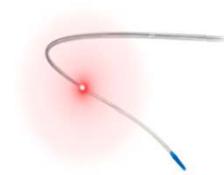
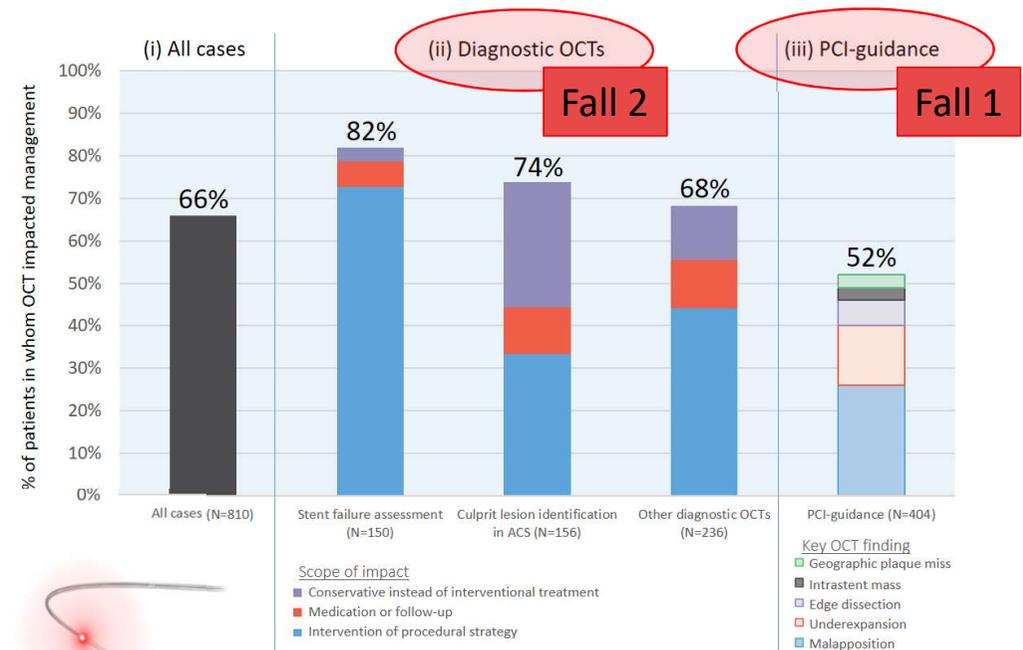
Assessment of periprocedural risks and post-procedural outcomes

Intracoronary imaging guidance by IVUS or OCT is recommended when performing PCI on **anatomically complex lesions**, in particular left main stem, true bifurcations, and long lesions



Vrints 2024 Eur Heart J

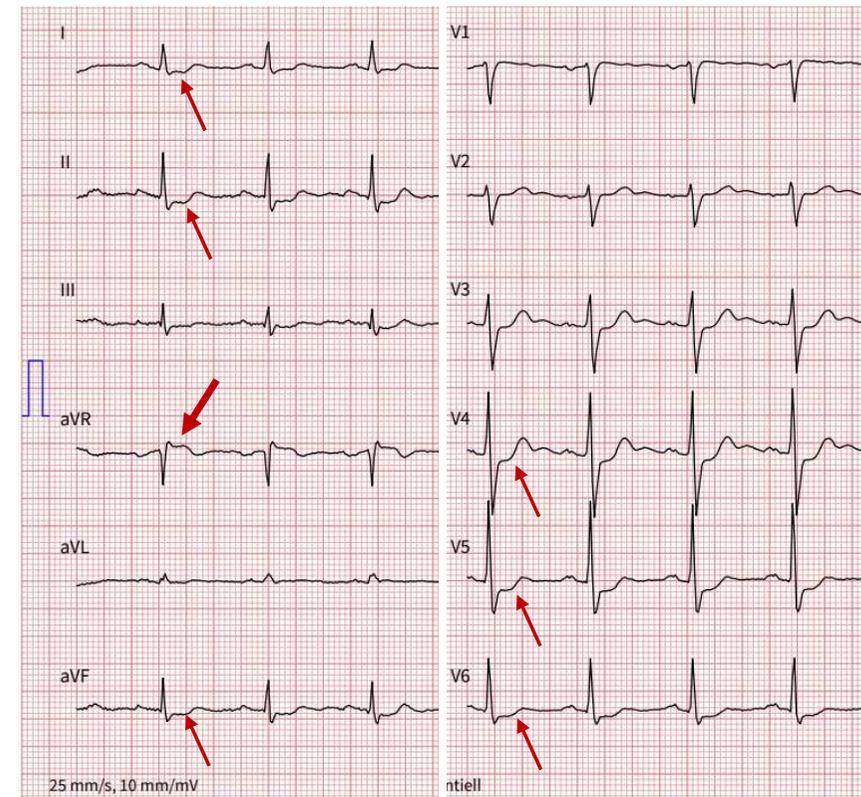
Wie oft und wie beeinflusst die intrakoronare Bildgebung das Management?



Häner 2022 Cardiovasc Revasc Med

Januar 2025 – Akuter Myokardinfarkt

- 79-j. Patientin
- Zuweisung via Rettungsdienst
- Retrosternales Druckgefühl seit dem Vorabend
- cvRF: arterielle Hypertonie, Dyslipidämie
- St.n. Carotis-interna Stenting rechts 2021 bei Amaurosis fugax

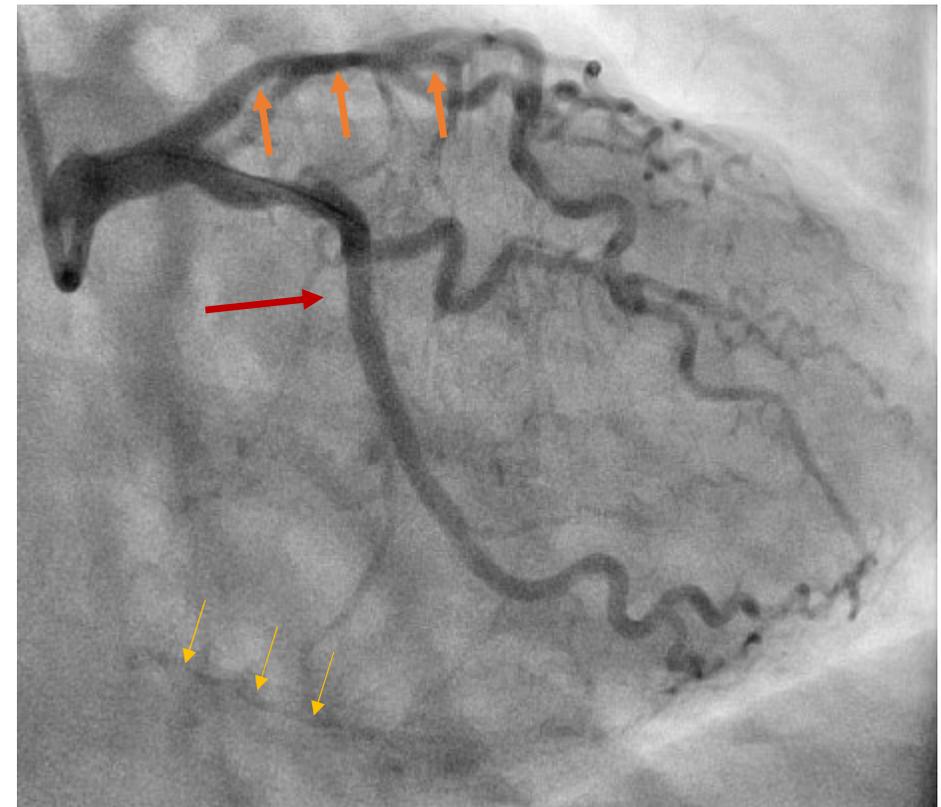


ST-Hebung in aVR; ST-Senkungen inferior / lateral

Januar 2025 - Koronarangiographie

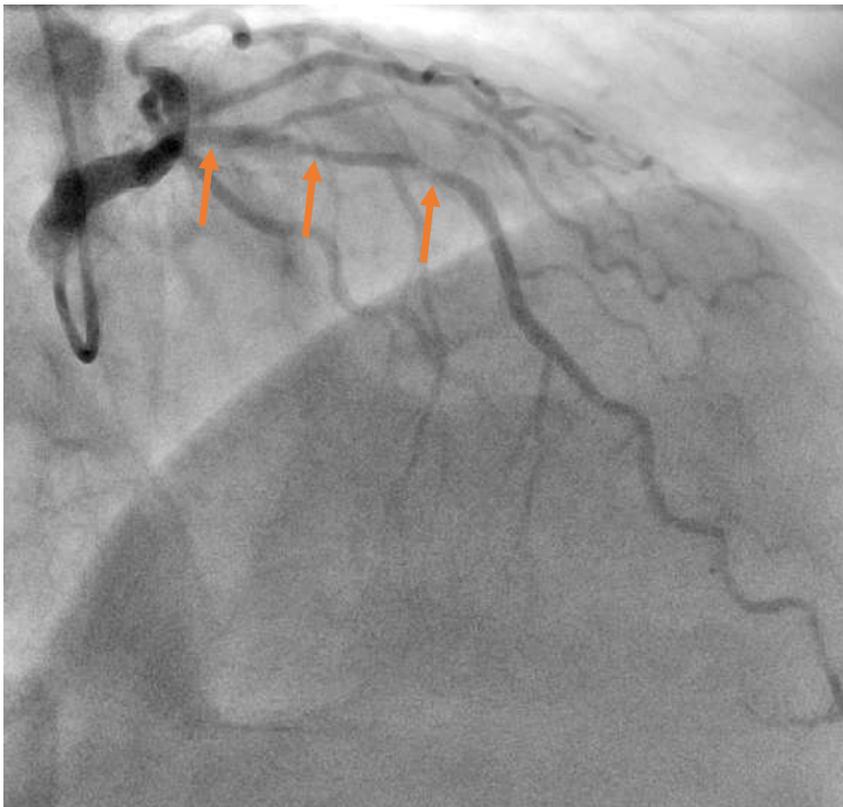


Culprit-Läsion: subtotale Stenose **RCX**

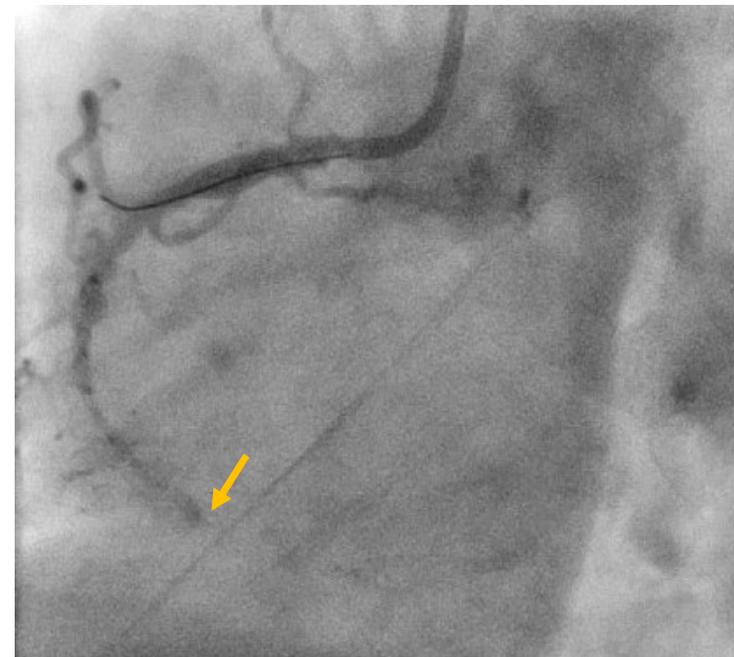


Behandlung **RCX**: 1 x Stent
Kollateralversorgung der **RCA**; Stenose des **RIVA**

Januar 2025 - Koronarangiographie



RIVA: langstreckige proximale Stenose



RCA: distal chronisch verschlossen

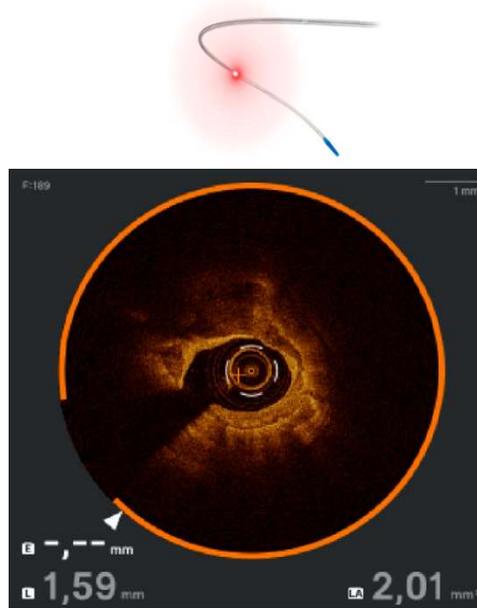
März 2025 – Staged PCI

Angiographie



Langstreckige proximale RIVA-Stenose

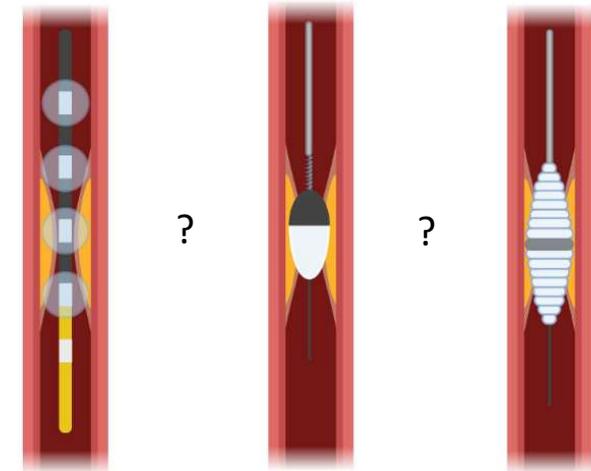
Läsionsbeurteilung



Optische Kohärenztomographie

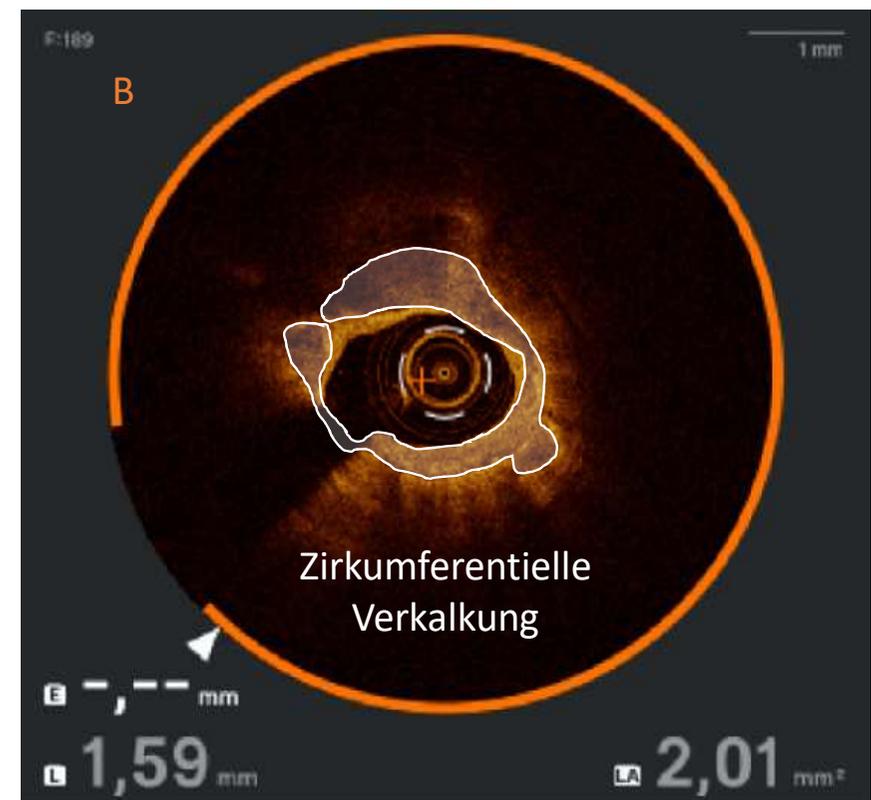
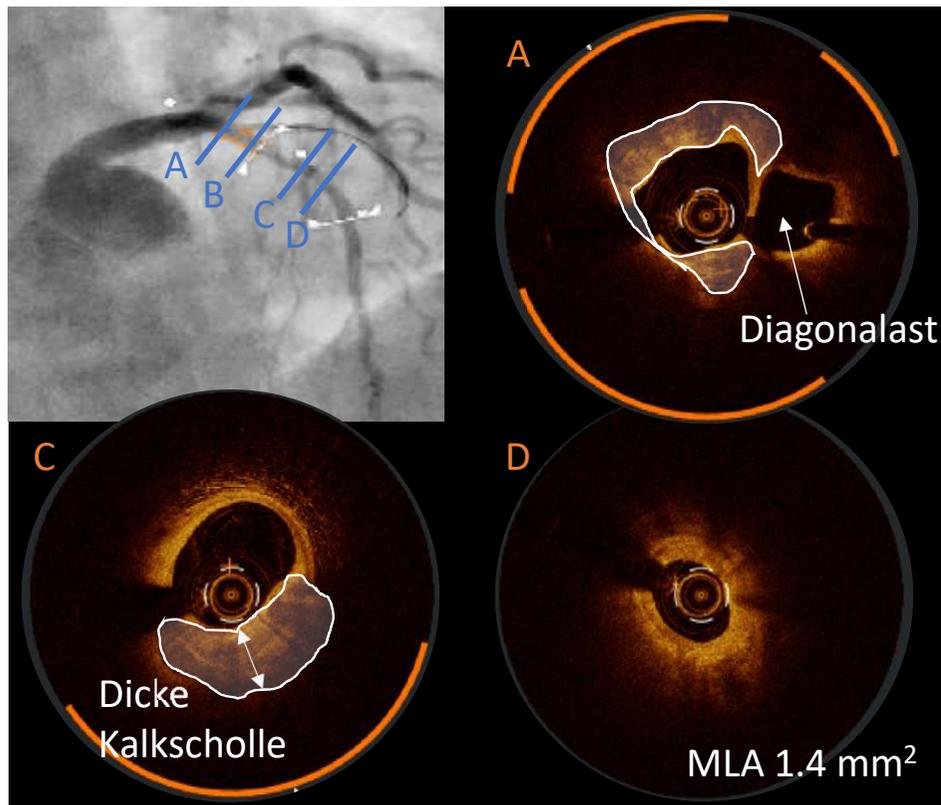
Wahl der Läsions-Vorbehandlung

Intravaskuläre Lithotrypsie Rotationelle Atherektomie Orbitale Atherektomie



Knacken oder bohren?

März 2025 – Staged PCI

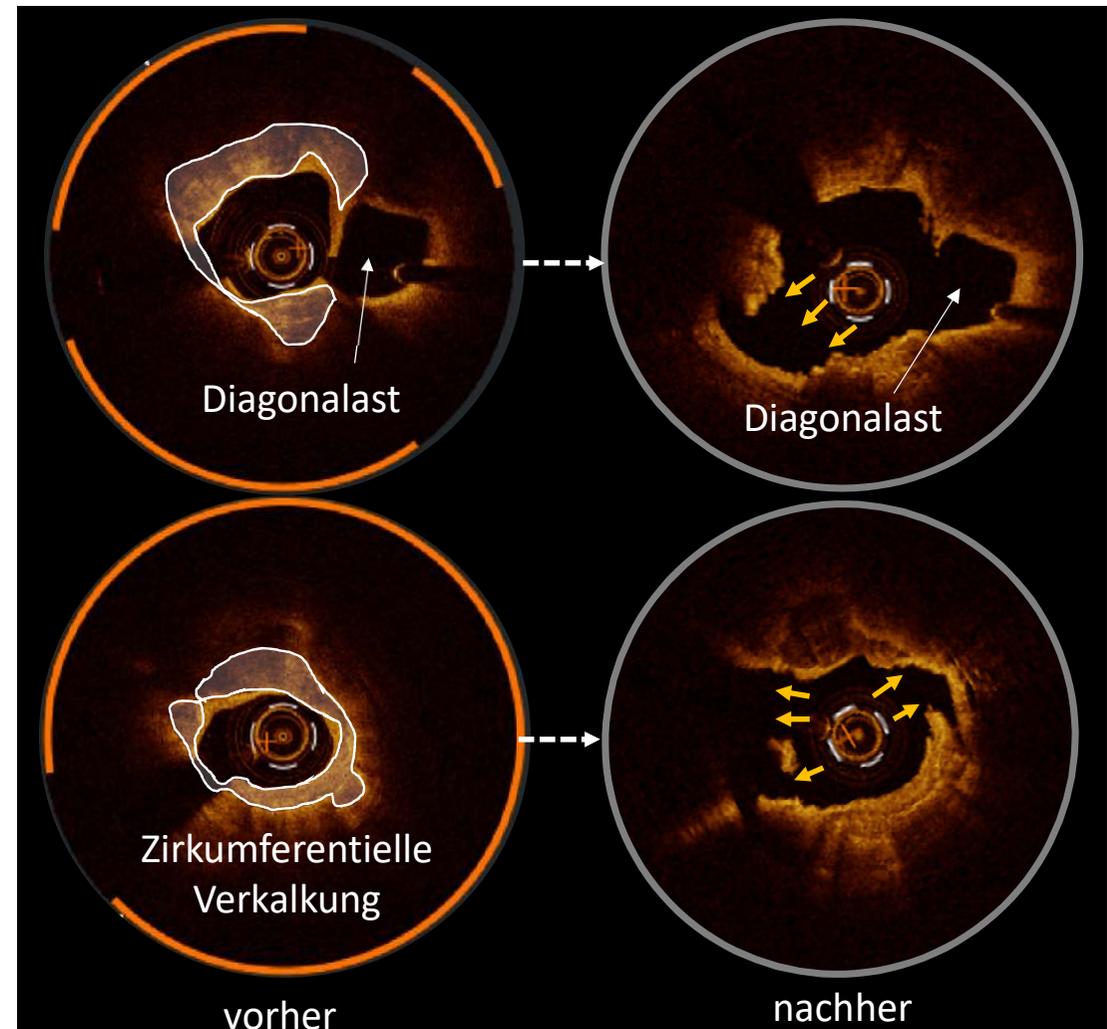


März 2025 – Staged PCI

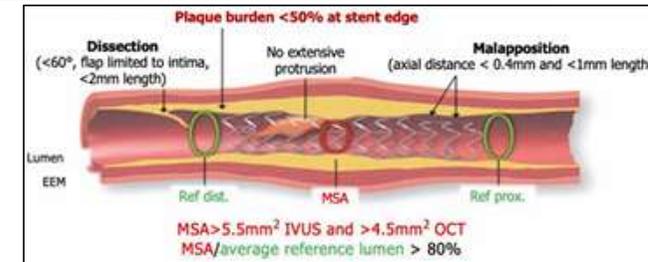
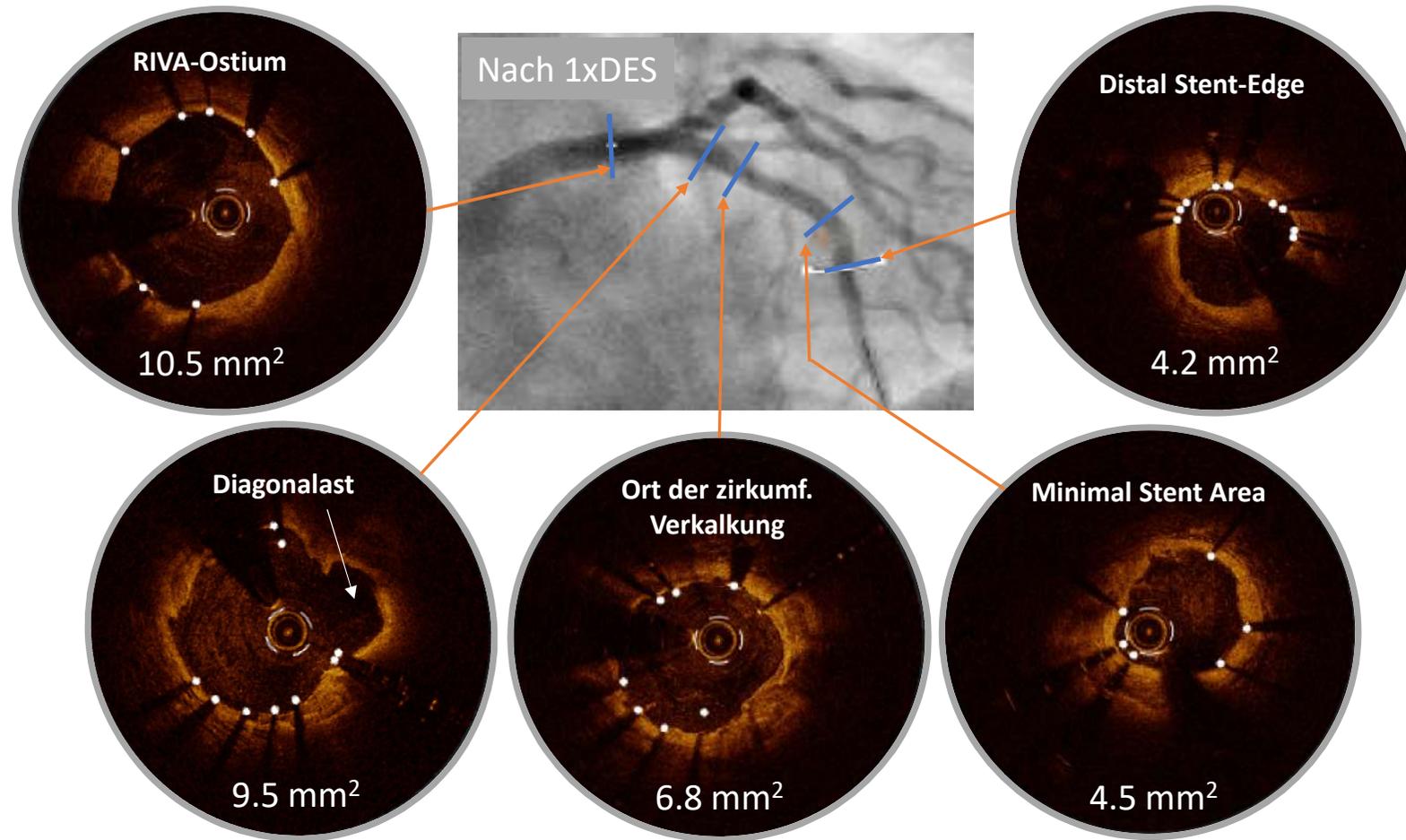
Intravaskuläre Lithotrypsie



Koronarballon mit Schallwellengenerator
12 Zyklen à 10 Pulse

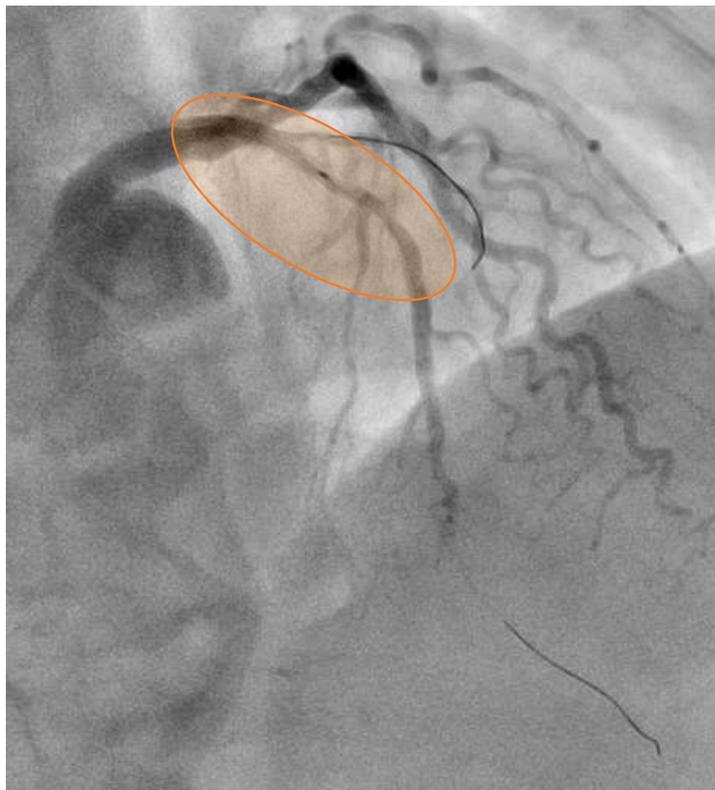


März 2025 – Staged PCI



- ✓ Gesamte Läsion abgedeckt (kein «geographic miss»)
- ✓ Keine Edge-Dissektion
- ✓ Gute Stentapposition
- ✓ Gute Stentexpansion (MSA > 4.5 mm²)
Tapering
- ✓ Kein protrudierendes Material (Kalk, Fett, Thrombus)

März 2025 – Staged PCI



vorher



nachher

Indikationen für PCI-Guidance mit intrakoronarer Bildgebung

Anatomische Charakteristika

- Hauptstammintervention*
- Bifurkationen* mit Seitenaststenting
- Lange Läsionen (>28 mm)*
- Schwere Verkalkungen, Ektasie

Patientencharakteristika

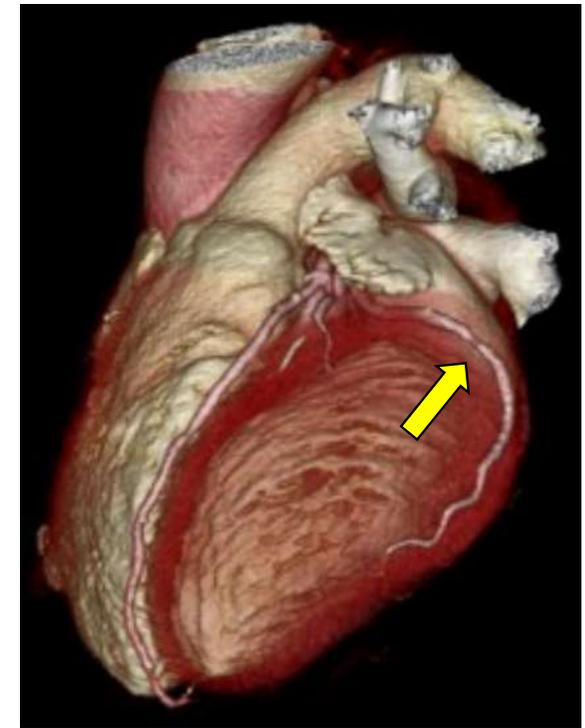
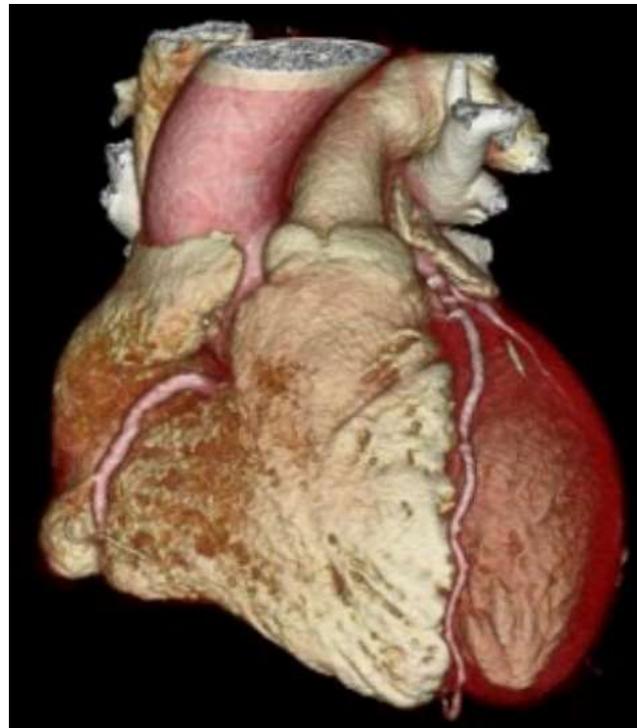
- Akutes Koronarsyndrom
- Diabetes mellitus

*IA Empfehlung in ESC-Guidelines

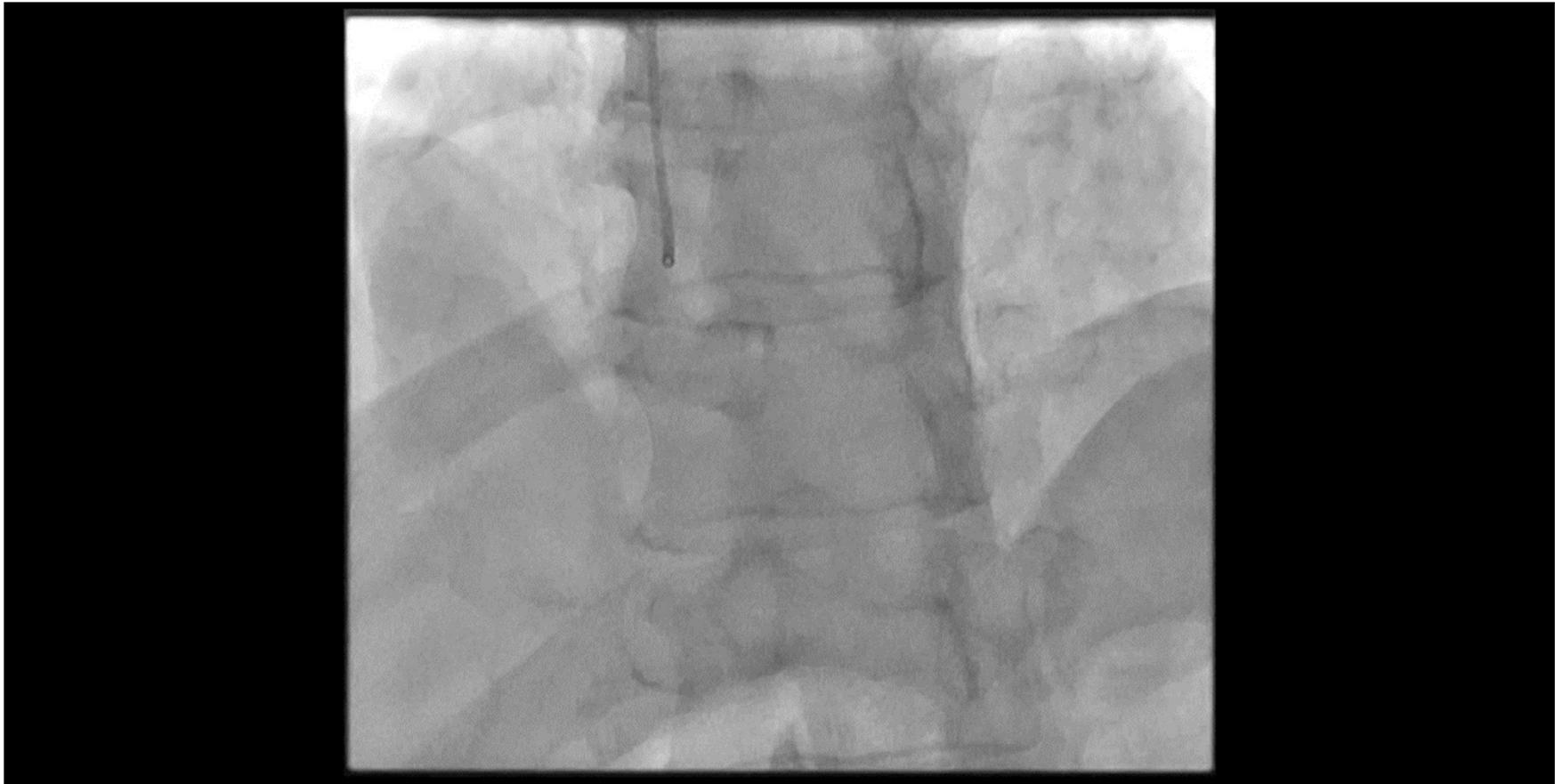
Wieso einfach wenn es auch kompliziert geht?

64 jähriger Mann

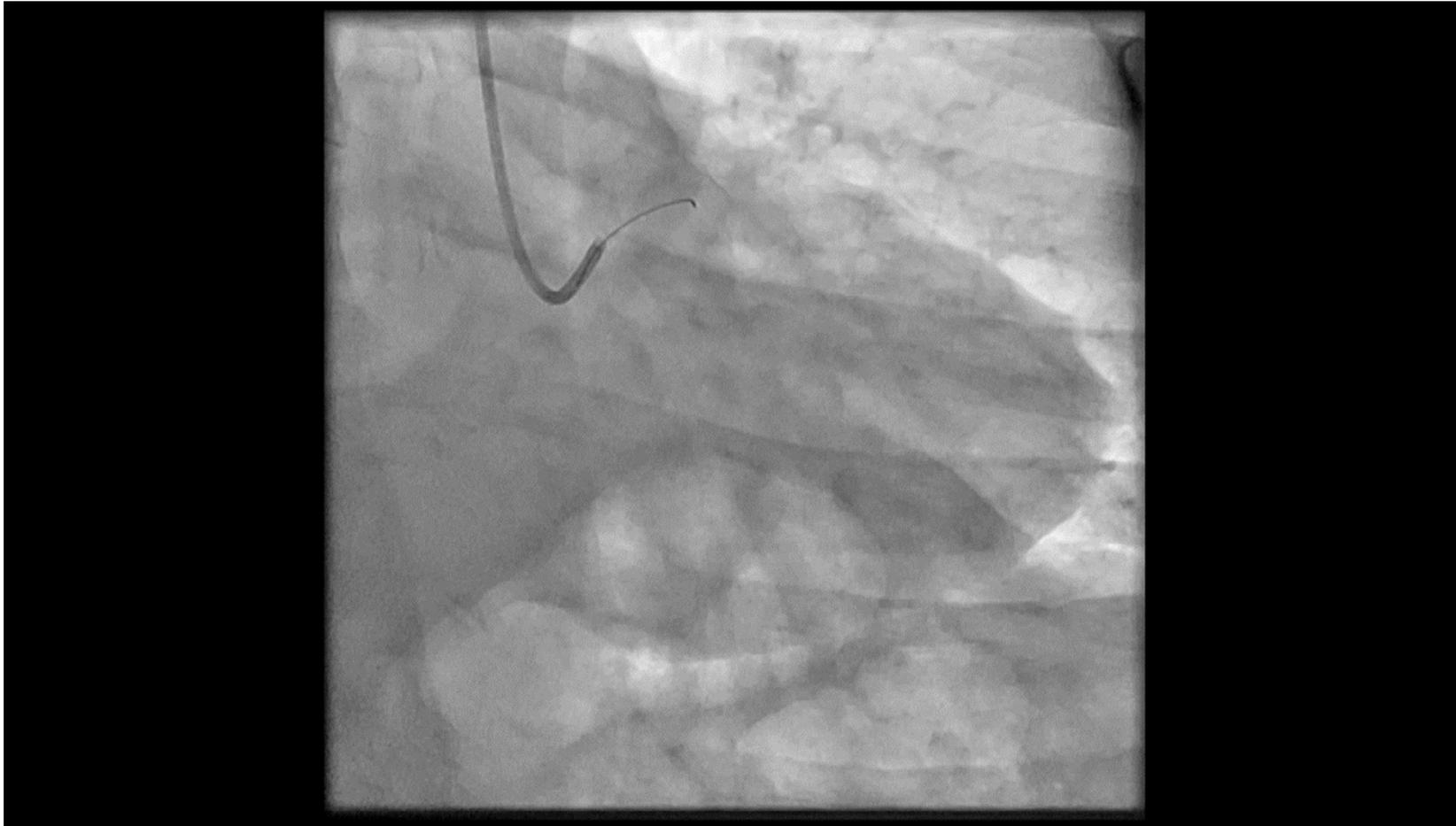
- Keine Beschwerden
- Positive Familienanamnese
- Mässige Dyslipidämie mit LDL
1.9 mmol/L unter Atorvastatin
20mg



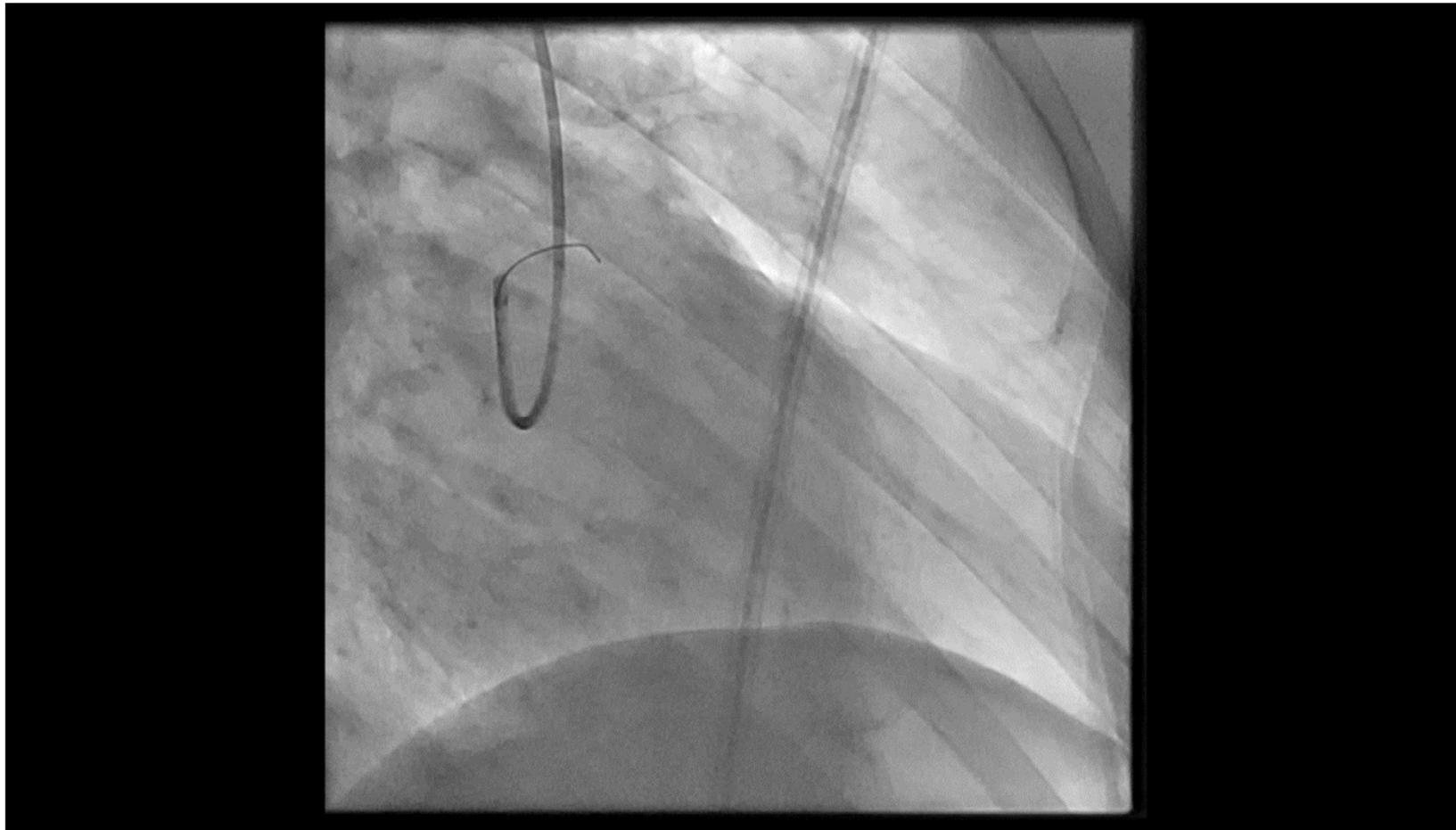
Koronarangiographie



Koronarangiographie



Koronarangiographie



Was sollen wir machen?

- **Konservatives Prozedere – Patient hat keine Beschwerden?**
- **Behandlung des RCX weil eng, kein Plaque-Sealing im RIVA?**
- **Behandlung RCX und RIVA?**

Warum behandeln wir die KHK?

Revascularization to improve outcomes	
In chronic coronary syndrome patients with left ventricular ejection fraction >35%	
In CCS patients with LVEF >35%, myocardial revascularization is recommended, in addition to guideline-directed medical therapy, for patients with functionally significant left main stem stenosis to improve survival. ^{718,719,859,860}	I A
In CCS patients with LVEF >35%, myocardial revascularization is recommended, in addition to guideline-directed medical therapy, for patients with functionally significant three-vessel disease to improve long-term survival and to reduce long-term cardiovascular mortality and the risk of spontaneous myocardial infarction. ^{55,56,317,732-734}	I A
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- Für Prognose**
- Hauptstamm
 - 3-Gefäss KHK
 - 1-2 Gefäss KHK mit prox. RIVA

Revascularization to improve symptoms	
In CCS patients with persistent angina or anginal equivalent, despite guideline-directed medical treatment, myocardial revascularization of functionally significant obstructive CAD is recommended to improve symptoms. ^{50,321,402,732,734,757}	I A

- Für Symptome**
- Angina trotz medikamentöser Therapie

Warum behandeln wir die KHK?

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Für Prognose

- Hauptstamm
- 3-Gefäss KHK
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	I	A

Für Symptome

- Angina trotz medikamentöser Therapie

Was sind prognostisch relevante Läsionen

The use of one or more of the following test results is recommended to identify individuals at high risk of adverse events:⁴⁰⁵

- exercise ECG:
 - Duke Treadmill Score < -10 ;¹⁹¹
- stress SPECT or PET perfusion imaging:
 - area of ischaemia $\geq 10\%$ of the LV myocardium;^{287,315,422,423,435}
- stress echocardiography:
 - ≥ 3 of 16 segments with stress-induced hypokinesia or akinesia;⁴³⁵
- stress CMR:
 - ≥ 2 of 16 segments with stress perfusion defects or ≥ 3 dobutamine-induced dysfunctional segments;⁴³⁵
- CCTA:
 - left main disease with $\geq 50\%$ stenosis, three-vessel disease with $\geq 70\%$ stenosis, or two-vessel disease with $\geq 70\%$ stenosis, including the proximal LAD or³¹⁷ one-vessel disease of the proximal LAD with $\geq 70\%$ stenosis and FFR-CT ≤ 0.8 .

I

B

Hohes Risiko für Events

-
- Ergo: Duke Treadmill Score < -10
 - Szintigraphie / PET Ischämie $\geq 10\%$
 - Stress-Echo ≥ 3 Segmente
 - Stress-MRI ≥ 2 Segmente
 - Koronar-CT: Hauptstamm, 1-2 Gefäss KHK mit prox. LAD, 3-Gefäss KHK

In individuals at high risk of adverse events (regardless of symptoms), ICA—complemented by invasive coronary pressure (FFR/iFR) when appropriate—is recommended, with the aim of refining risk stratification and improving symptoms and cardiovascular outcomes by revascularization.^{318,319}

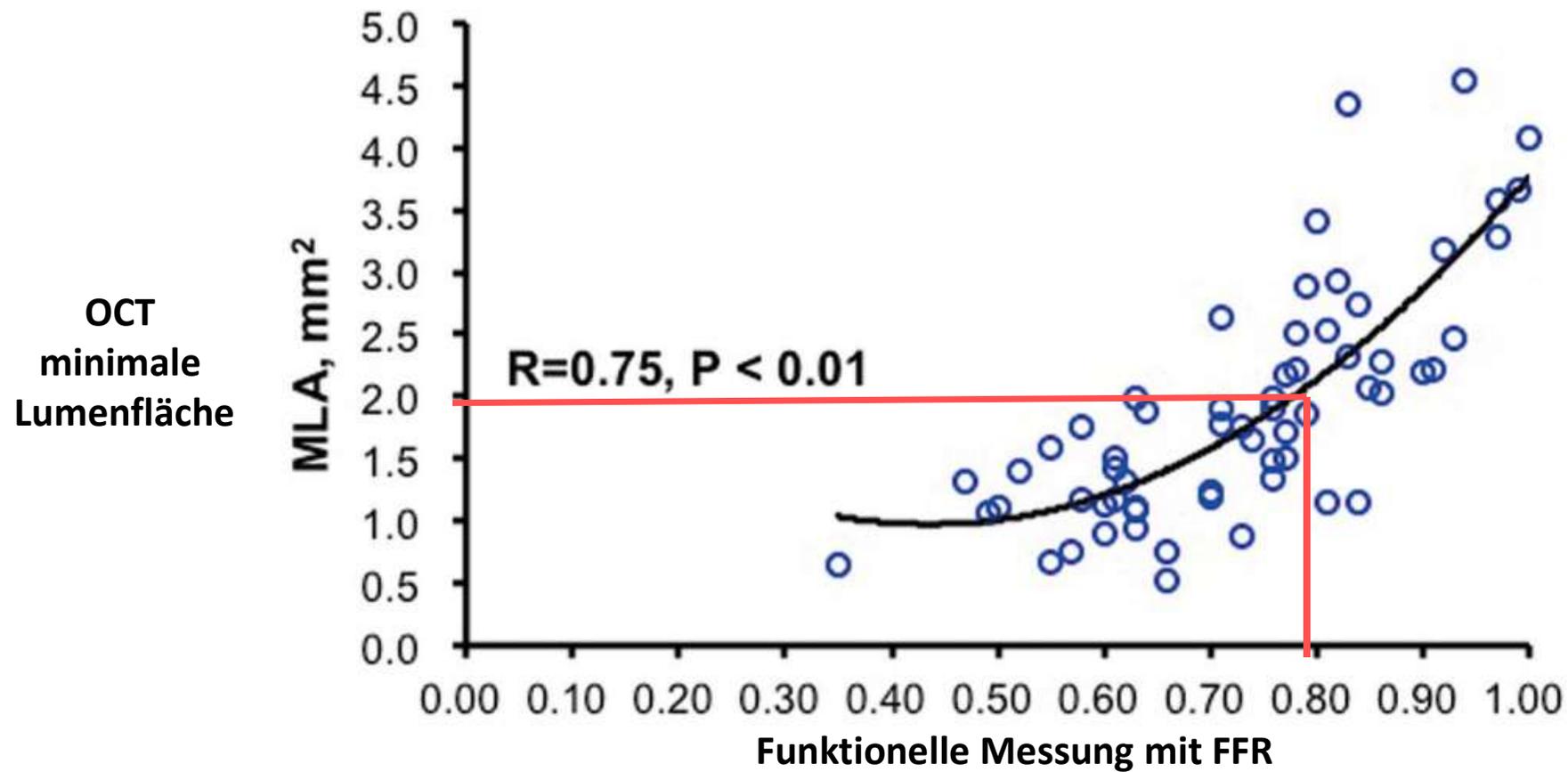
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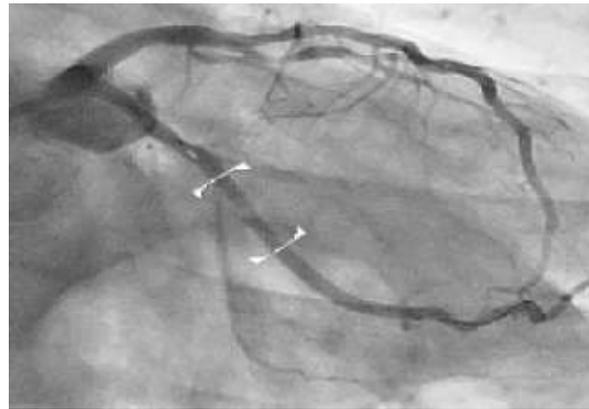
Was sind prognostisch relevante Läsionen



Hämodynamische Evaluierung mit FFR?

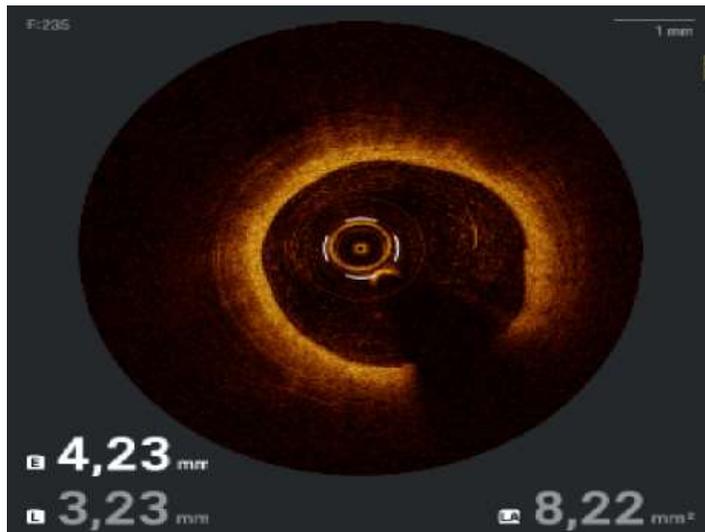


Optische Kohärenztomographie RCX

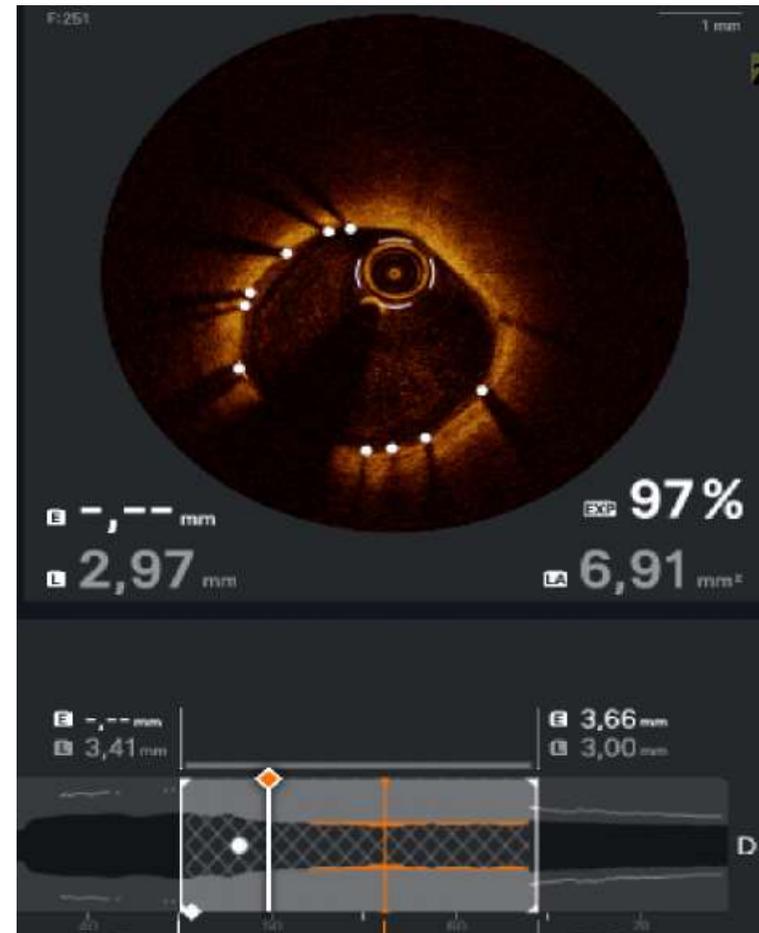


Proximal

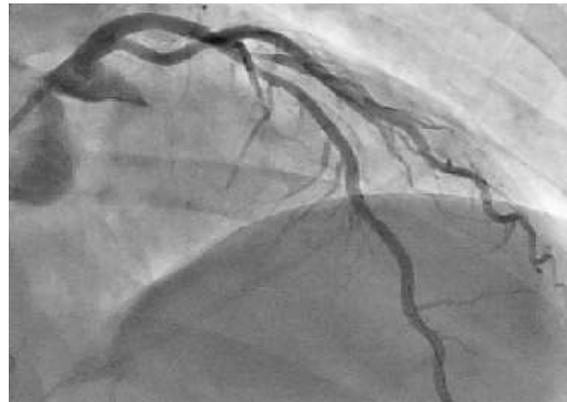
Distal



Behandlung RCX

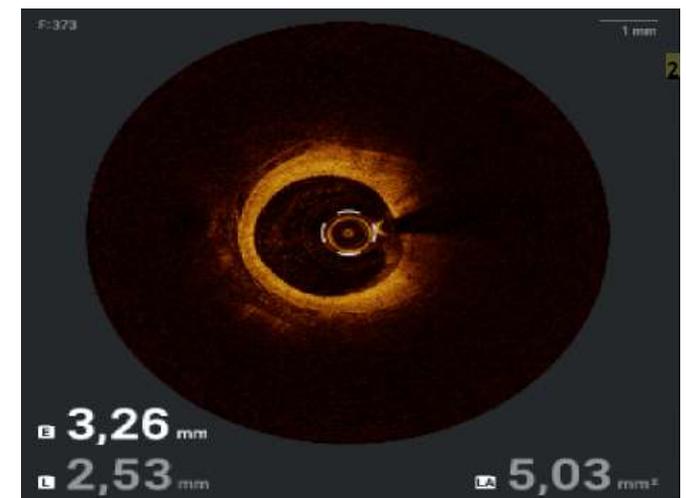
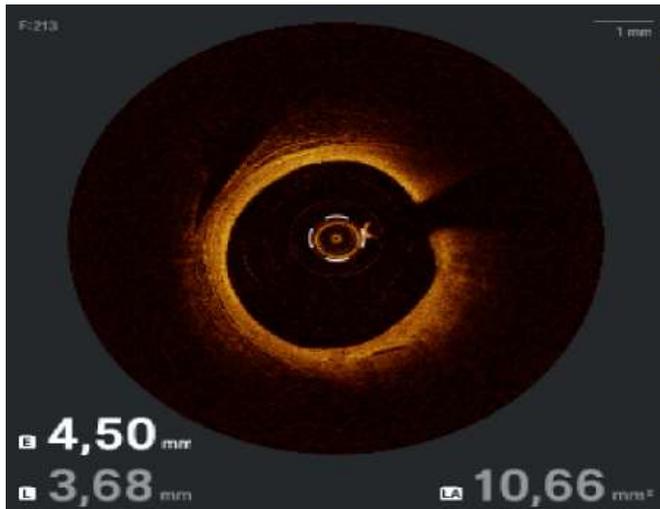


Optische Kohärenztomographie RIVA

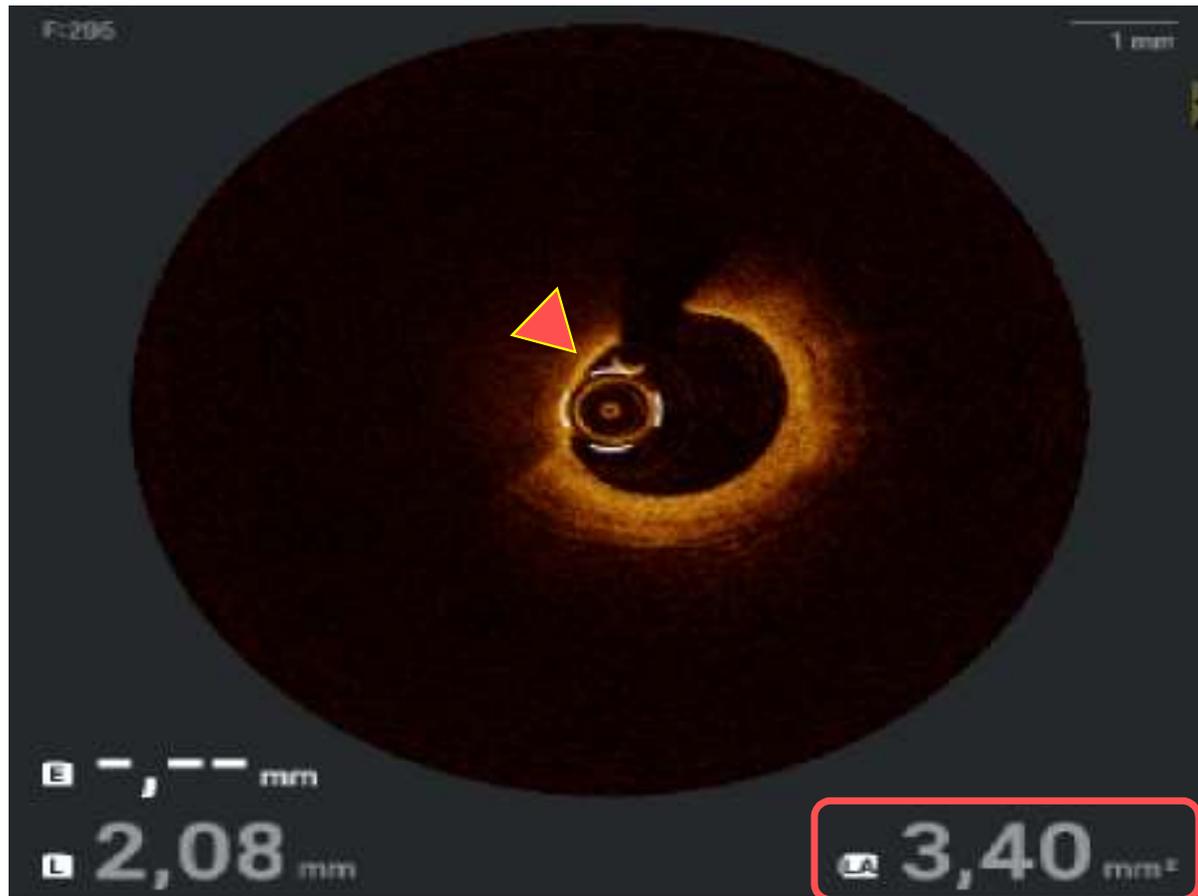


Proximal

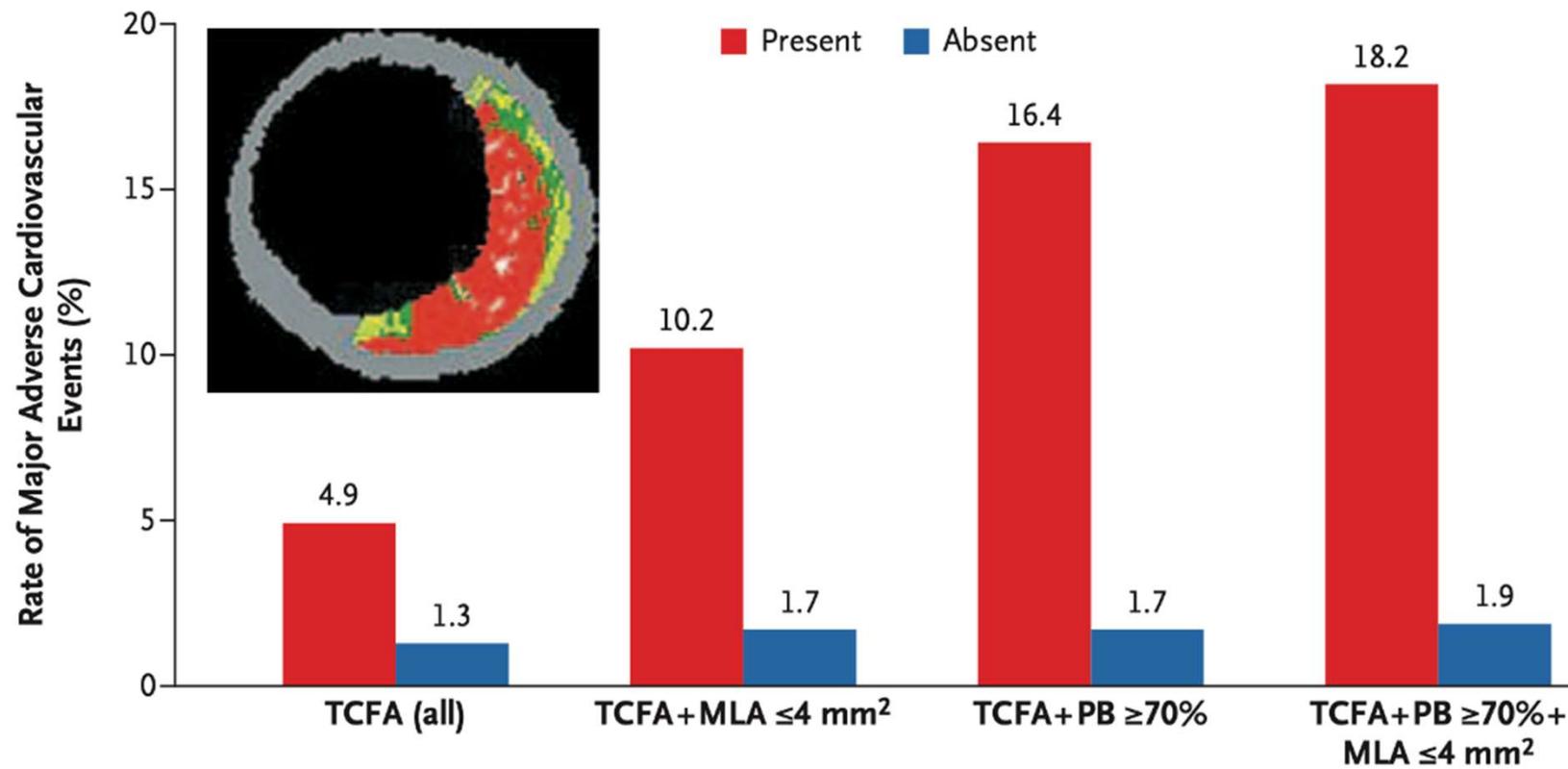
Distal



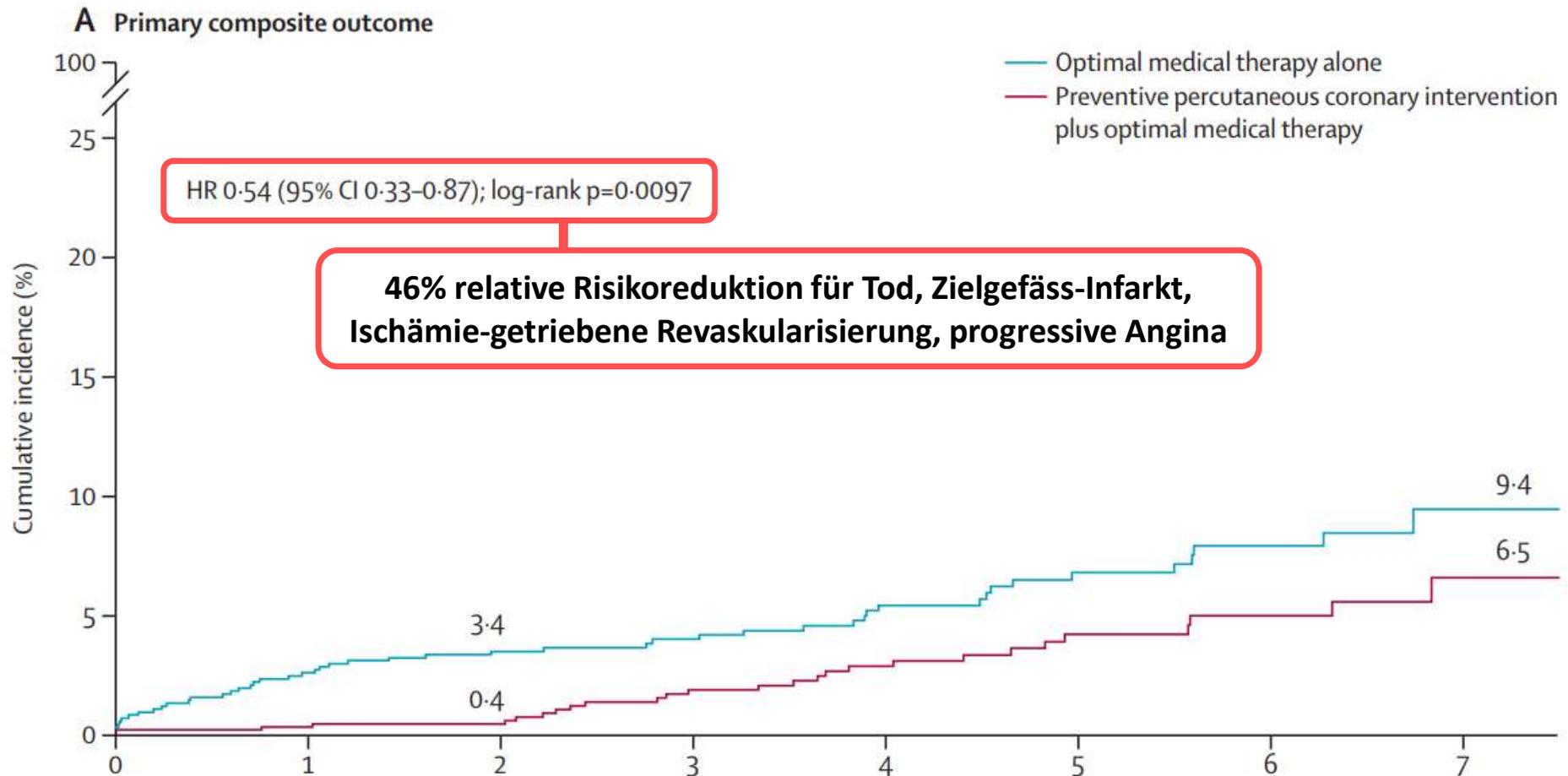
Optische Kohärenztomographie RIVA



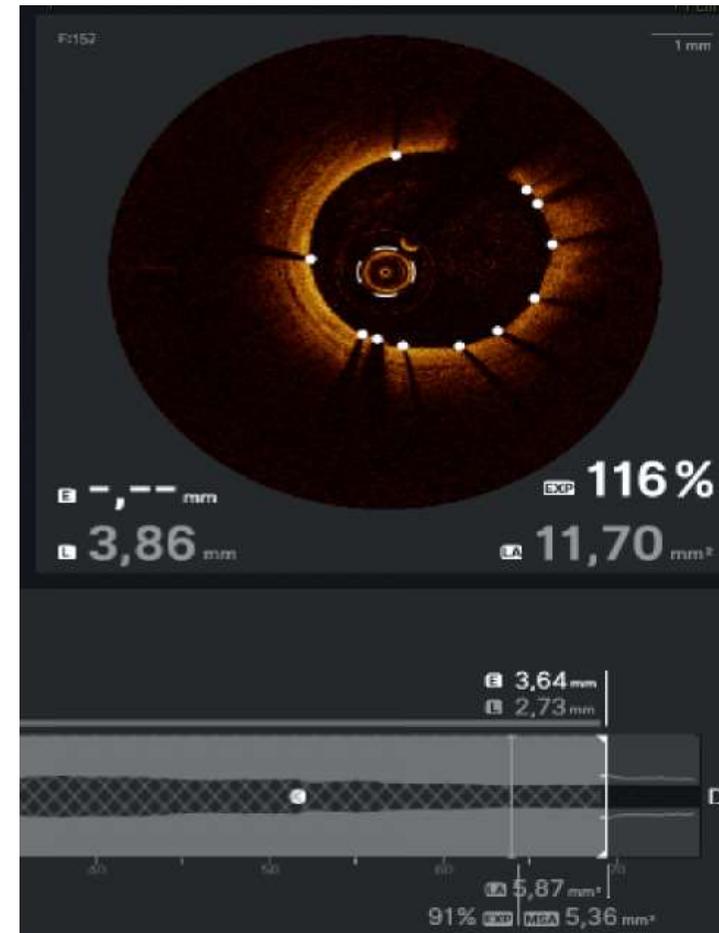
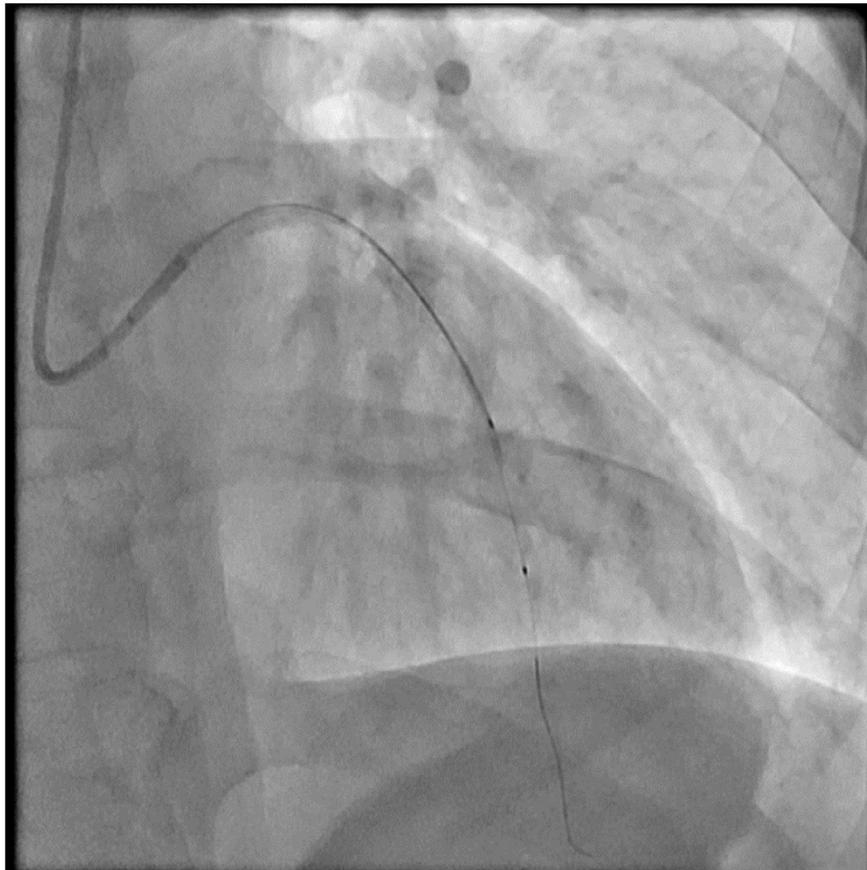
Vulnerable Plaque



Vulnerable Plaque



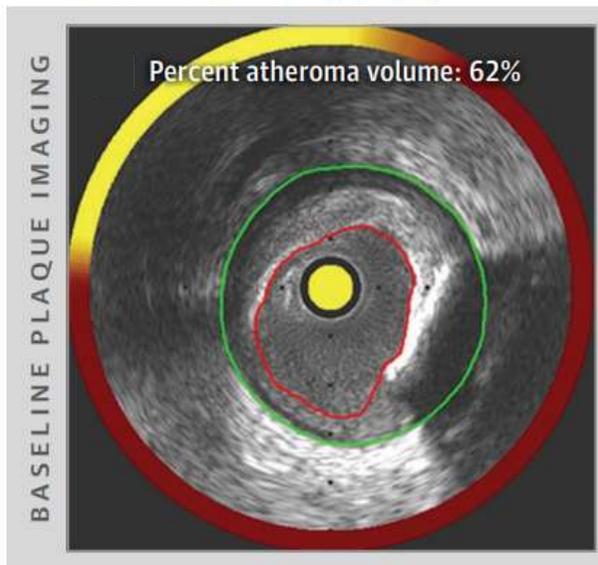
Behandlung RIVA



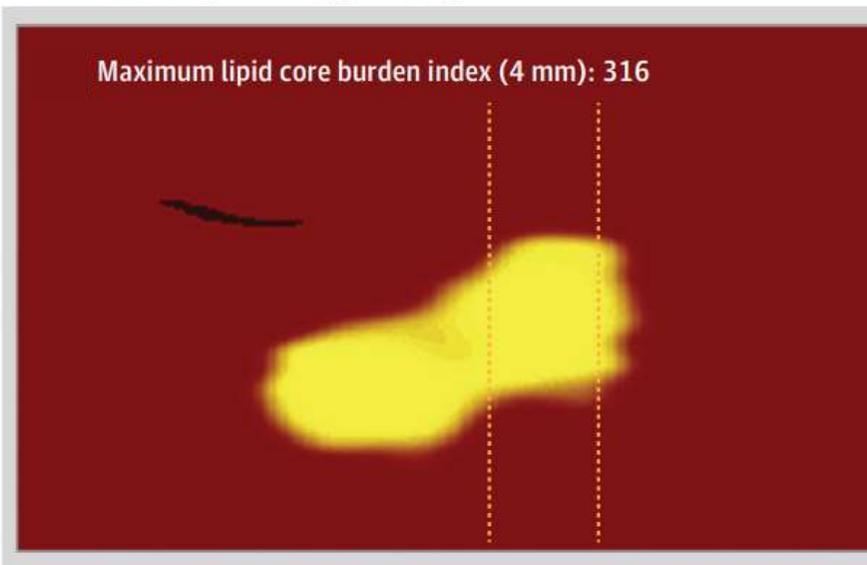
Conclusion

- Das “Plaque-Sealing” wurde früher belächelt
- Wir können heute vorhersagen welche Läsionen mit einem Herzinfarkttrisiko einhergehen
- Die präventive KHK-Therapie ist ein Meilenstein der medizinischen Entwicklung mit stützender hochqualitativer Evidenz

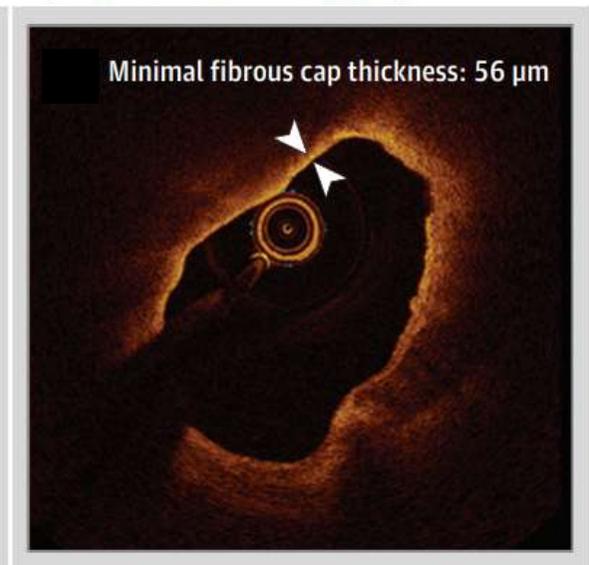
Intravascular ultrasonography



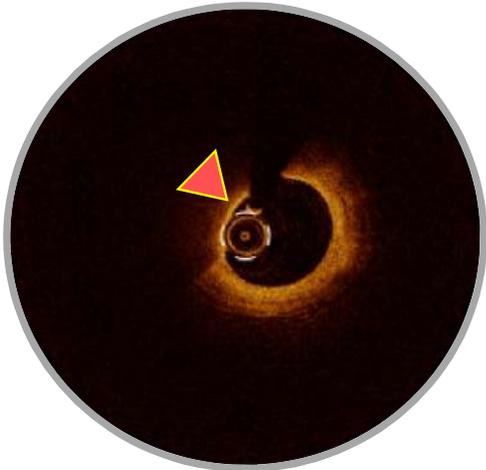
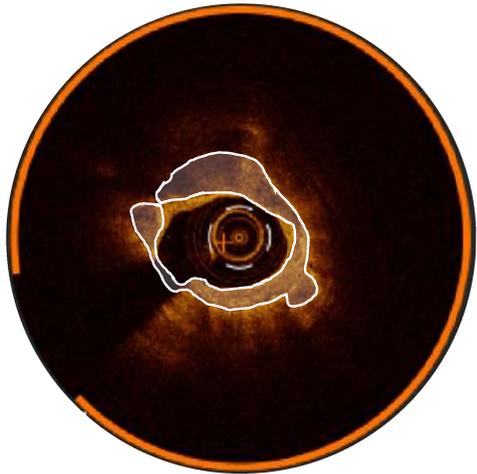
Near-infrared spectroscopy chemogram



Optical coherence tomography



Herzlichen Dank für die Aufmerksamkeit



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