

Disclosures

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- Receives grant /research support from
 - Toshiba Medical Systems
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Diagnostic Performance of Combined Noninvasive Coronary Angiography and Myocardial Perfusion Imaging Using 320-row Detector Computed Tomography:

The CORE320 Multicenter International Study

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Background

- The benefits of revascularization are highest in patients who have coronary stenoses that are flow limiting and hemodynamically significant.
- Invasive angiography and CT angiography are **limited** in delineating flow-limiting lesions which are detected by perfusion imaging or invasive FFR.
- A single test which can non invasively evaluate the severity of a lesion and the hemodynamic significance is desirable for the management of patients with symptomatic CAD.

Main Objectives/Study Design

To evaluate:

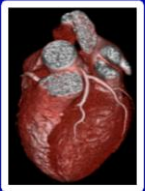
- The diagnostic performance of combined CTA and CTP to identify patients with flow limiting CAD compared with invasive angiography and SPECT-MPI
- Incremental value of CTP above CTA alone
- Prediction of coronary revascularization vs. ICA + SPECT
- 381 patients from 16 hospitals in 8 countries who were clinically referred for ICA underwent SPECT-MPI and a combined CT angiography and myocardial perfusion scan.

Core Laboratory Image Analysis

Coronary Image Analysis



Angiography Core Lab



CT Angiography Core Lab

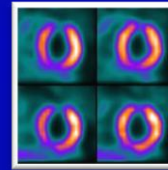
Two readers

- Differences resolved by consensus

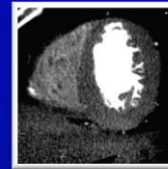
Entire coronary tree analyzed

- 19 segment model
- Stented segments included
- Visual assessment on all segments
- Stenosis $\geq 30\%$ quantified
- Maximum % stenosis

Myocardial Perfusion Analysis



SPECT-MPI Core Lab



CT Perfusion Core Lab

Two readers

- Double Blinded Analysis
- Differences resolved by consensus

13 Segment myocardial model

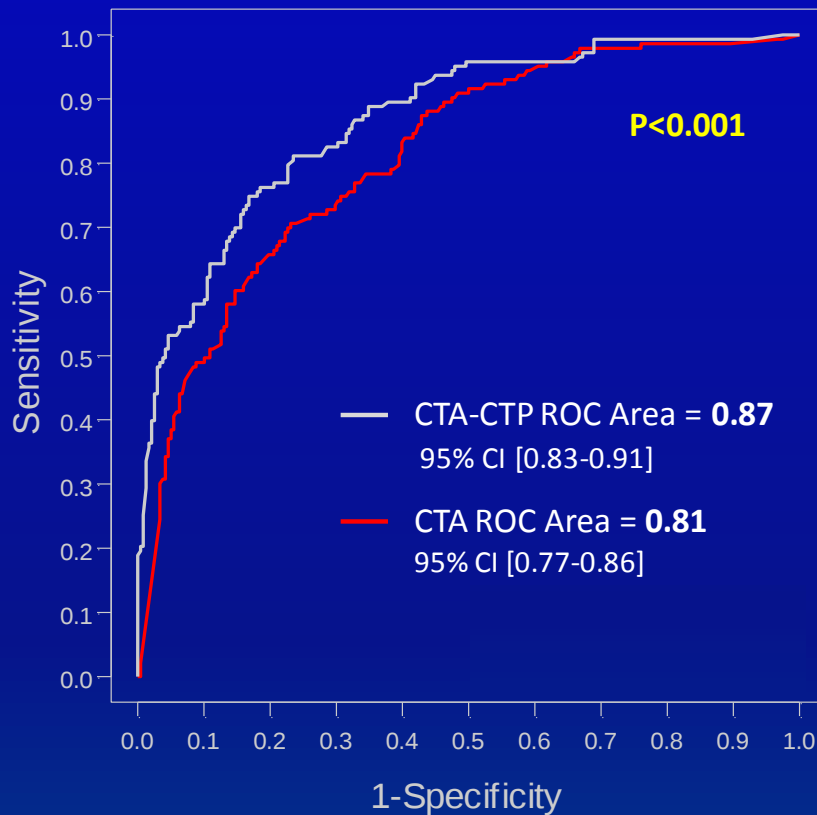
- Visual assessment
 - 0 = normal
 - 1 = mild perfusion deficit
 - 2 = moderate perfusion deficit
 - 3 = severe perfusion deficit

Baseline Characteristics

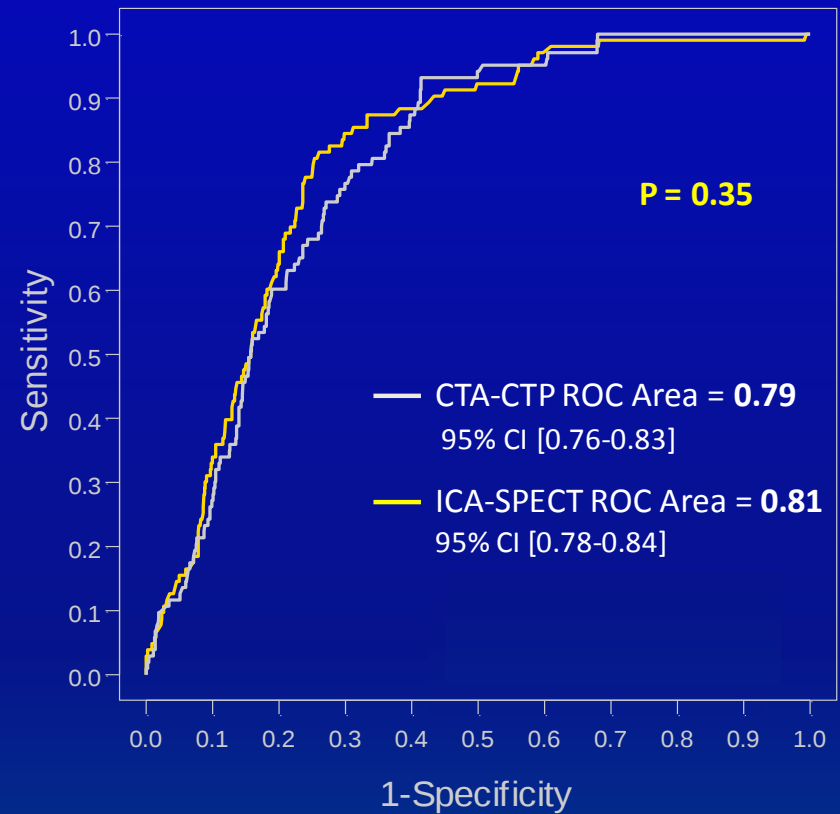
Age – Median [IQR]	62 [56-68]
Men – number [%]	258 [66%]
Body Mass Index – Median [IQR]	27 [24-30]
Hypertension – number [%]	302 [78%]
Diabetes – number [%]	132 [34%]
Dislipidemia – number [%]	261 [68%]
Previous MI – number [%]	95 [25%]
Smoking (Current + Former) – number [%]	202 [53%]
Prior PCI – number [%]	112 [29%]
Family history of CAD – number [%]	167 [45]
Creatinine – mg/dl – Median [IQR]	0.9 (0.7-1.0)

Results

Incremental Value of CTA-CTP over CTA (Reference Standard: 50% by ICA with SPECT-MPI defect)



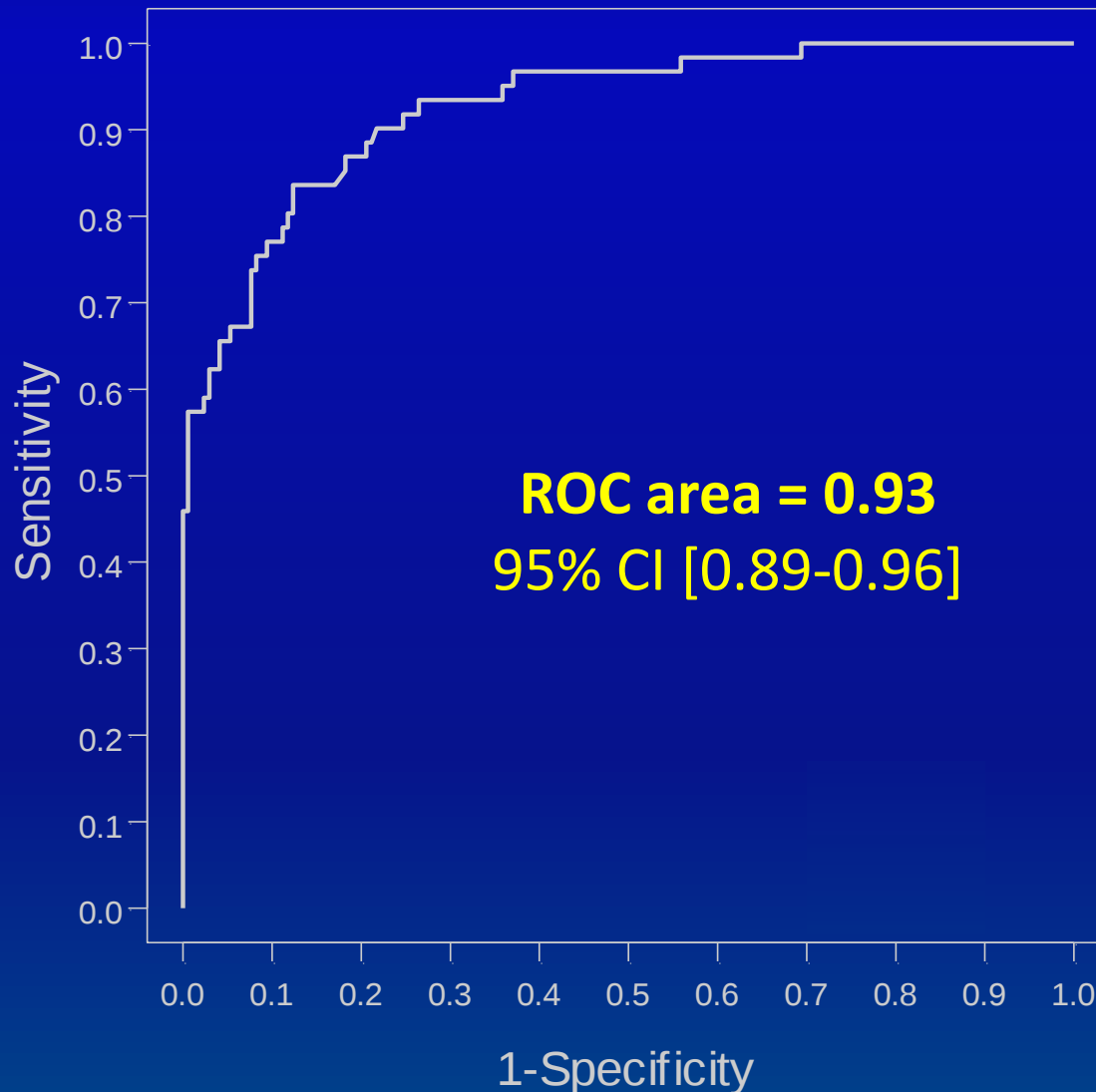
CTA-CTP vs. ICA/SPECT to predict Vessel Level Revascularization (Reference Standard: Revascularization at 30 days)



Patient Based Results – Known CAD Excluded

Patient-Based Analysis for participants **without** history of CAD

(Reference Standard: 50% by ICA with a corresponding myocardial perfusion defect on SPECT-MPI)



Patient Based
Combined CTA-CTP
vs.
Reference Standard
(ICA 50% with SPECT-
MPI defect)

N=231

Prevalence = 26%

Patients with Known CAD Excluded

	Sensitivity	Specificity	PPV	NPV
CTA alone ≥ 50% Stenosis (95% CI)	93 (84-98)	60 (52-67)	46 (37-55)	96 (91-99)
CTP SSS				
0	97 (89-100)	58 (50-65)	45 (36-54)	98 (93-100)
1	90 (80-96)	67 (59-74)	49 (40-59)	95 (89-98)
2	89 (78-95)	69 (61-76)	51 (41-60)	94 (89-98)
3	84 (72-92)	74 (67-81)	54 (43-64)	93 (87-96)
4	80 (68-89)	80 (73-86)	59 (48-70)	92 (86-96)
5	71 (57-82)	87 (80-91)	65 (52-77)	89 (83-93)

Conclusions

- Combined CTA-CTP can detect flow-limiting stenoses defined by ICA (50% or greater) with an associated SPECT-MPI defect.
- CT perfusion adds significantly to the diagnostic power of CT angiography alone.
- The combination of CTA & CTP in one non-invasive exam is useful in identifying the patients who will benefit the most from revascularization and to guide the management of CAD.