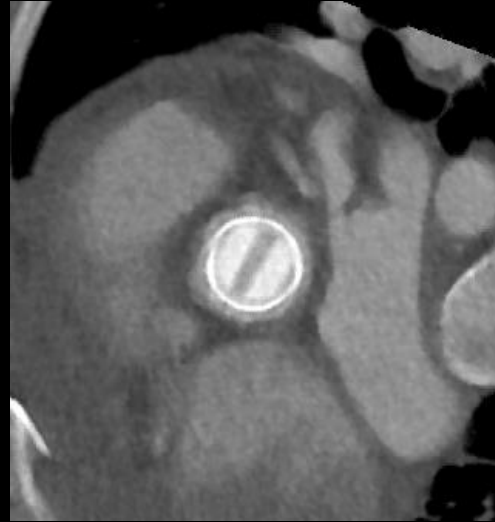


Klaffdiagnostik med datortomografi



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Klaffdiagnostik med datortomografi

- DT-teknik
- Kranskärlsdiagnostik
- Klaffutredning
- Endokardit



European Heart Journal (2024) **00**, 1–123
<https://doi.org/10.1093/eurheartj/ehae177>

ESC GUIDELINES

2024 ESC Guidelines for the management of chronic coronary syndromes

Developed by the task force for the management of chronic coronary syndromes of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS)



European Heart Journal (2025) **00**, 1–102
<https://doi.org/10.1093/eurheartj/ehaf194>

ESC GUIDELINES

2025 ESC/EACTS Guidelines for the management of valvular heart disease

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2023 ESC Guidelines for the management of endocarditis

Developed by the task force on the management of endocarditis of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS) and the European Association of Nuclear Medicine (EANM)

DT hjärta – hur går det till?

Förberedelser

- Sätta nål
- Koppla EKG
- Ge betablockad
- Ge nitro
- Koppla jodkontrast

Mål

- Puls <60
- Dilaterade kranskärl



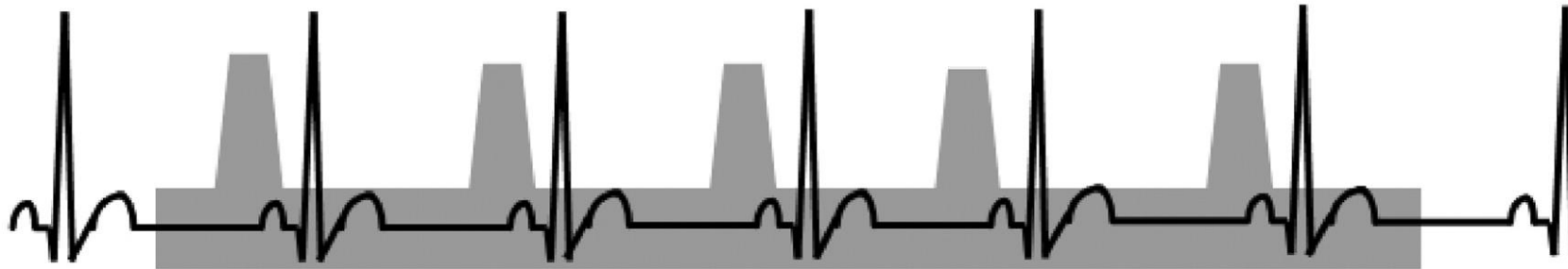
Scan

- Planera område
- Kör calcium scoring
- Ge testdos kontrast
- Beräkna fördröjning
- Kör hjärtscan (1-2 s)

EKG-styrning

8 mSv

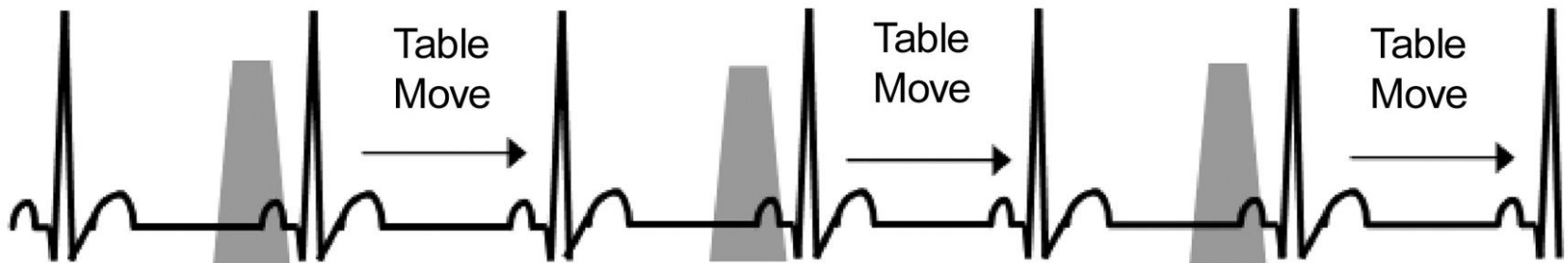
Retrospektiv EKG-styrning



2 mSv

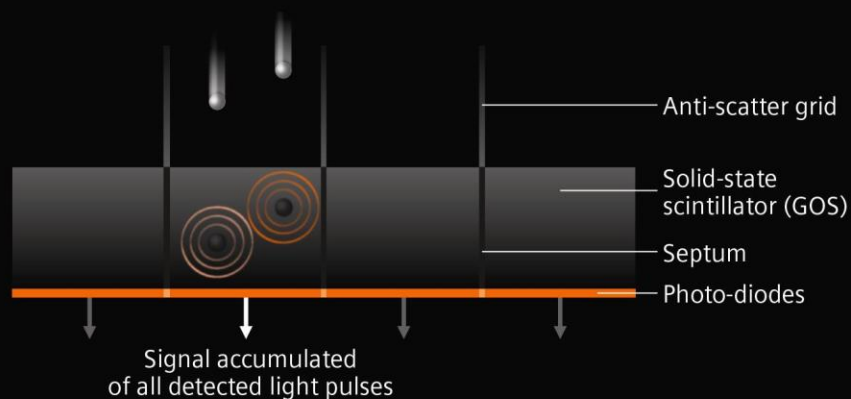
Prospektiv EKG-styrning

■ = Beam on



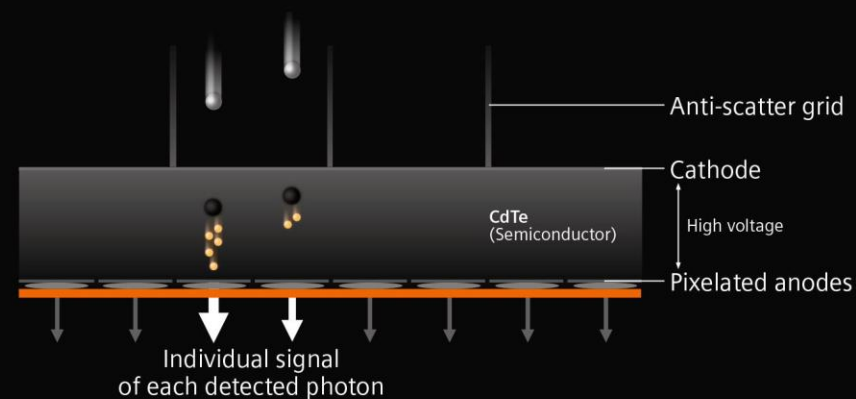
Fotonräknaren – en helt ny typ av detektor

Konventionell detektor



Detektorn består av celler där signalen konverteras till ljus

Fotonräknande detektor



Ökar upplösningen
Minskar bruset
Spektral information

Detektorn har inga septa/celler

Bilder från Siemens

Klaffdiagnostik med datortomografi

- CT-teknik
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Figure 6

Appropriate first-line testing in symptomatic patients with suspected CCS

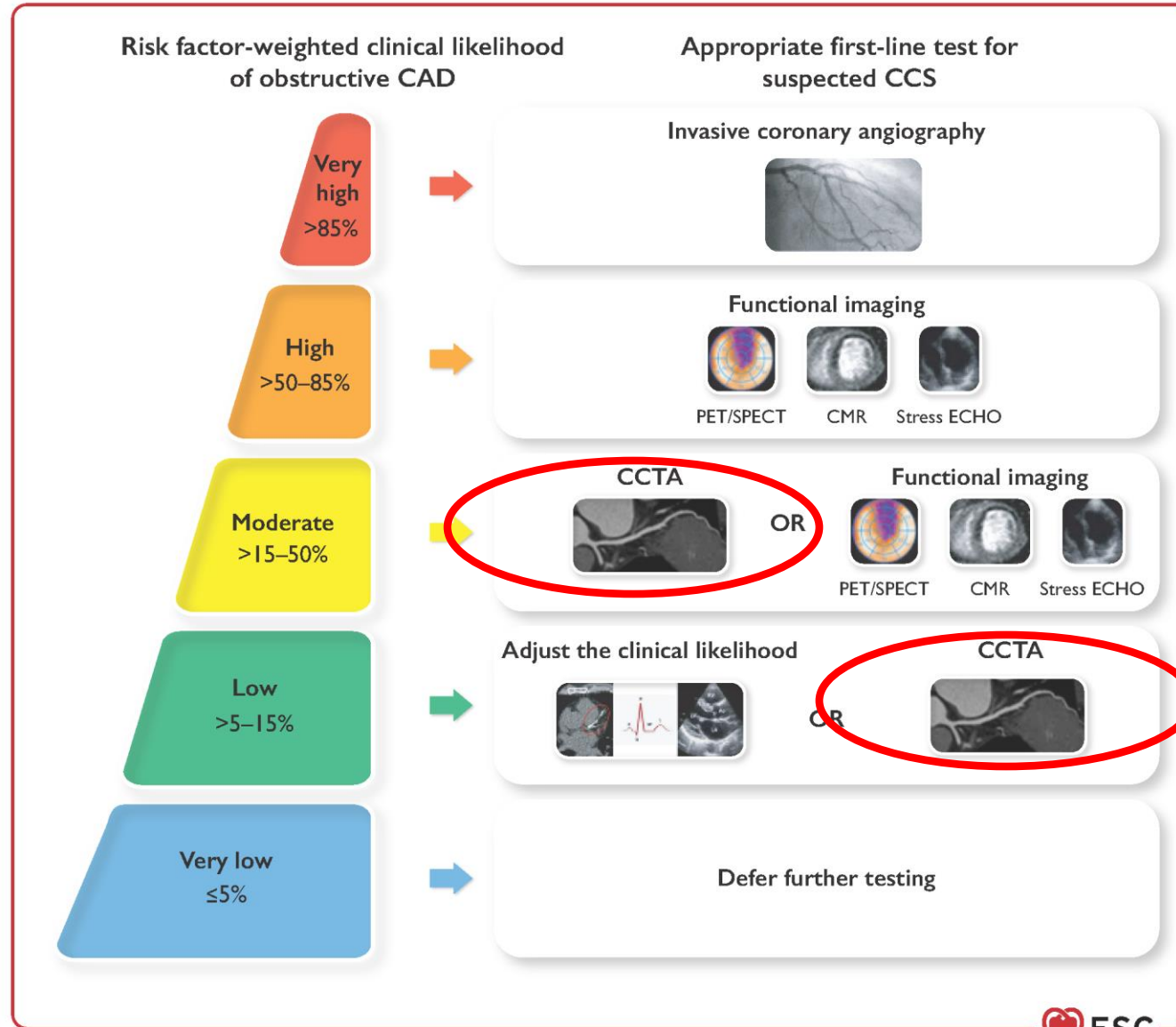
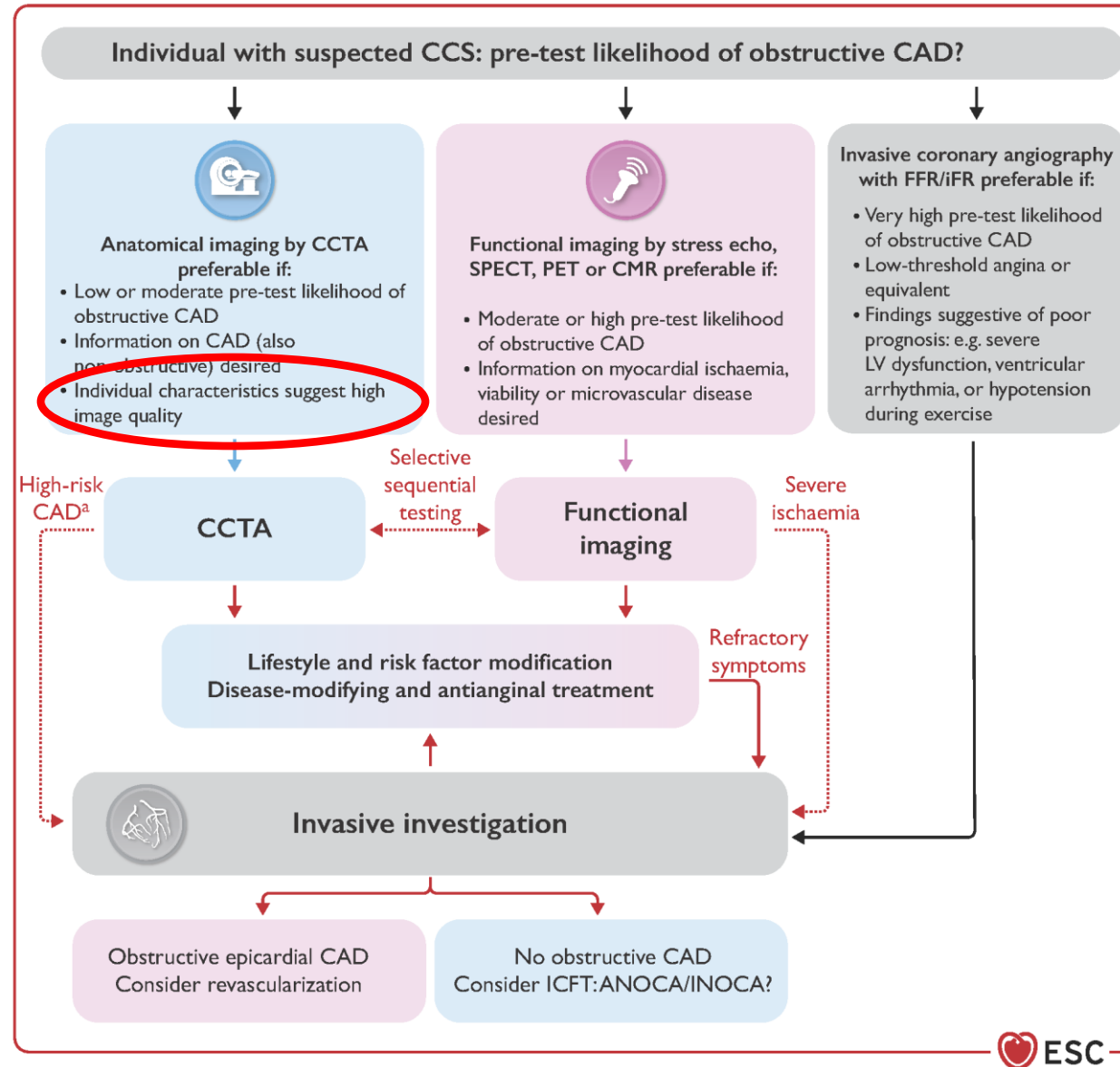


Figure 7

Initial management of symptomatic patients with suspected CCS



Patientberoende faktorer

- Förmaksflimmer, arrytmier
- Takykardi, kontraindikation mot betablockad
- Obesitas
- Dyspné
- Njursvikt
- KALK!

Bedömning av kranskärl kräver högst bildkvalité

Viktig info i remissen

- Krea, njurfunktion
- Sinusrytm / förmaksflimmer? Arrytmier?
- Kontraindikation mot betablockad?
- Kontraindikation mot nitro?
- Kan patienten medverka?

Calcium blooming – kalk ser större ut än den är!

LAD

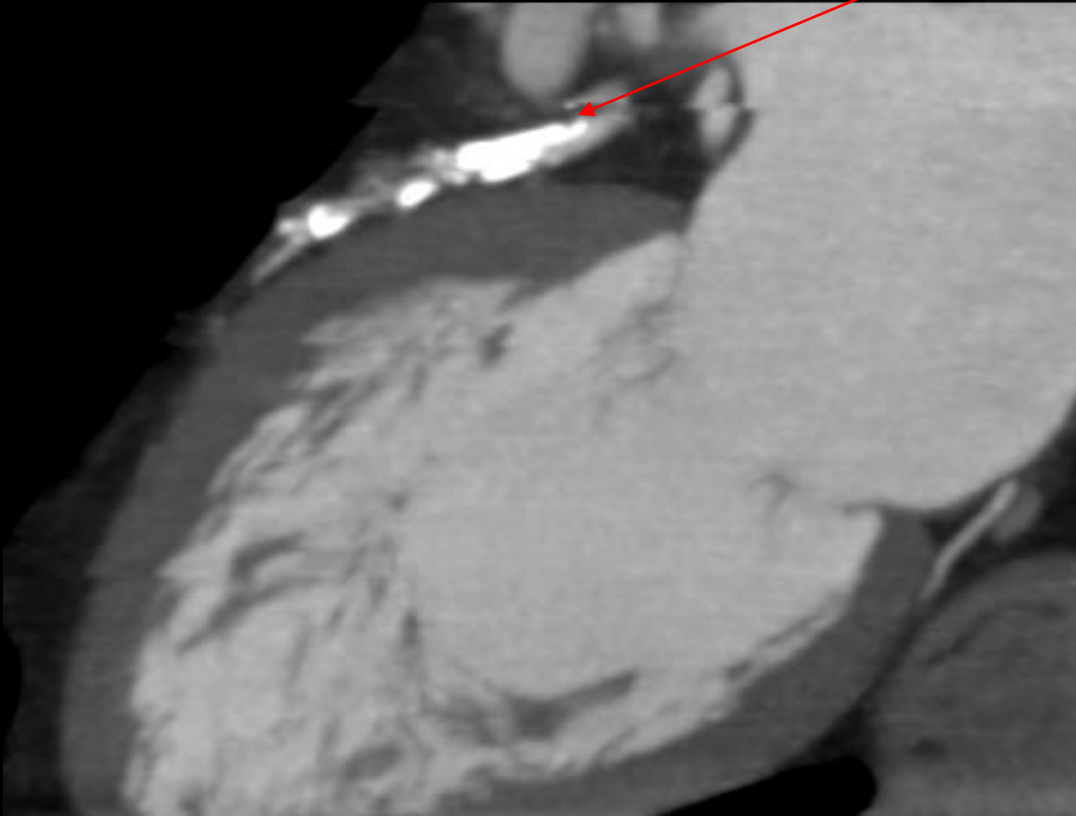


Table 4 Revised recommendations

Recommendations in 2021 version	Class ^a	Level ^b	Recommendations in 2025 version	Class ^a	Level ^b
Management of coronary artery disease in patients with valvular heart disease—Section 6.1					
CCTA should be considered as an alternative to coronary angiography before valve surgery in patients with severe VHD and low probability of CAD.	IIa	C	CCTA is recommended before valve intervention in patients with moderate or lower ($\leq 50\%$) pre-test likelihood of obstructive CAD.	I	B

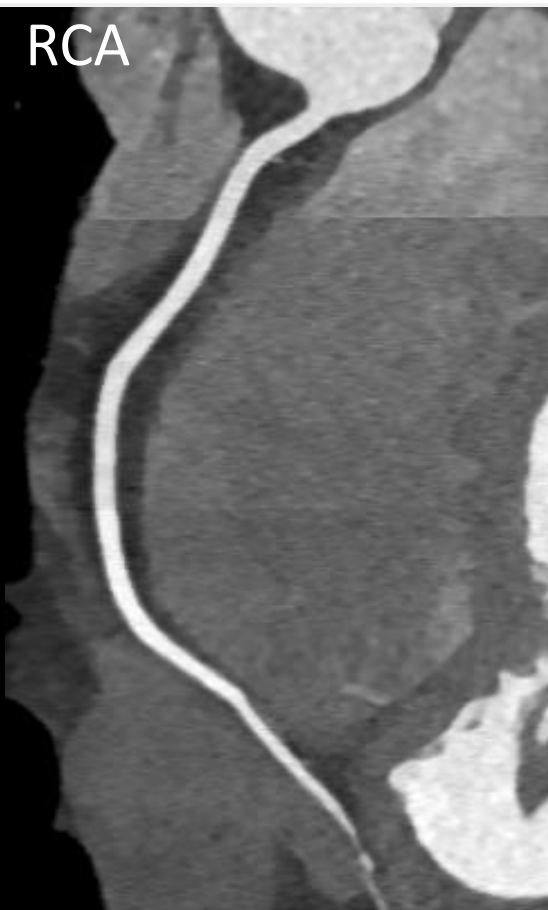
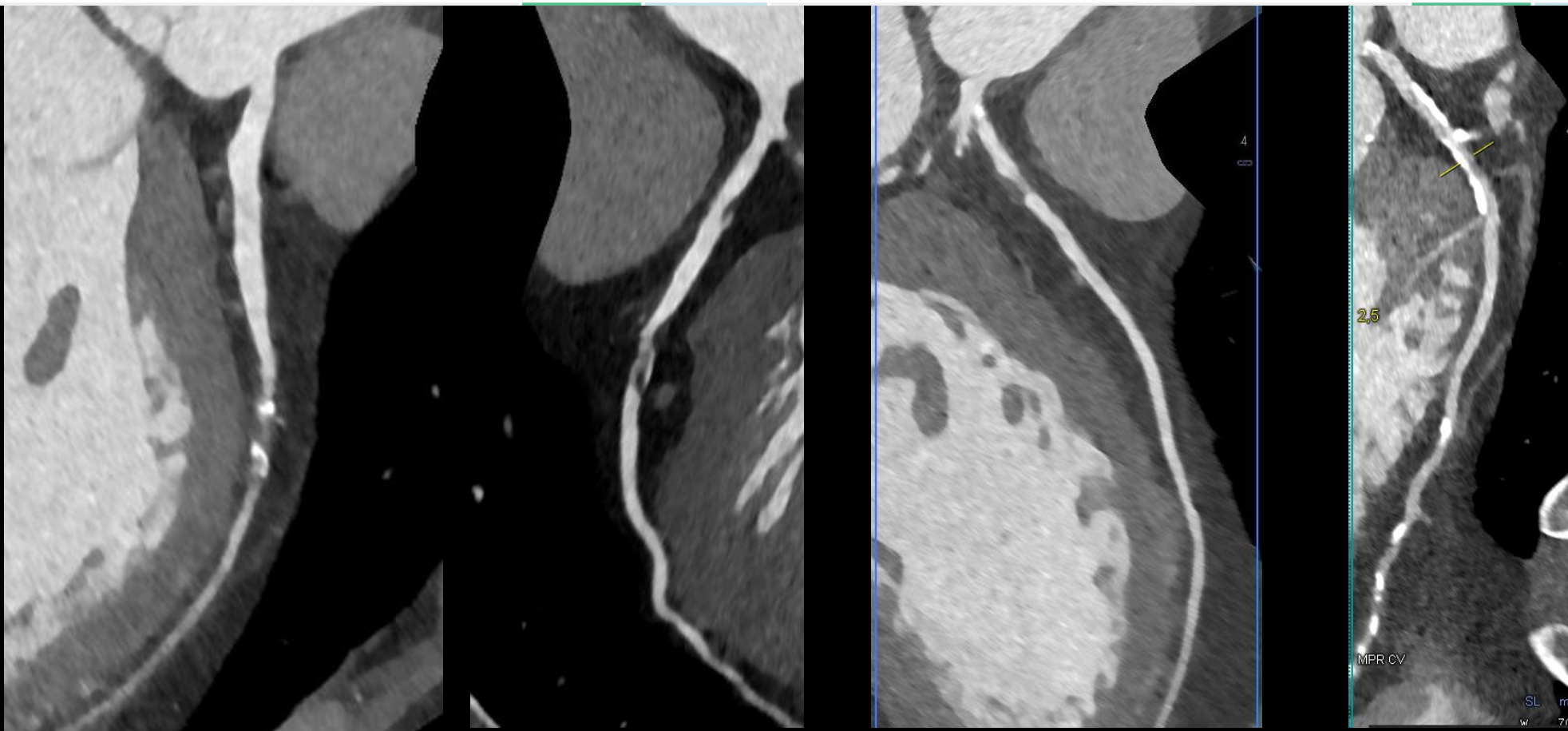


Table 4 Revised recommendations

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Fotonräknare



- Högre spatiell upplösning
- Ned till 0,2 mm snitt
- Spektral info

Klaffdiagnostik med datortomografi

- CT-teknik
- Kranskärlsdiagnostik
- Klaffutredning**
- Endokardit



ESC

European Society
of Cardiology

European Heart Journal (2025) 00, 1–102

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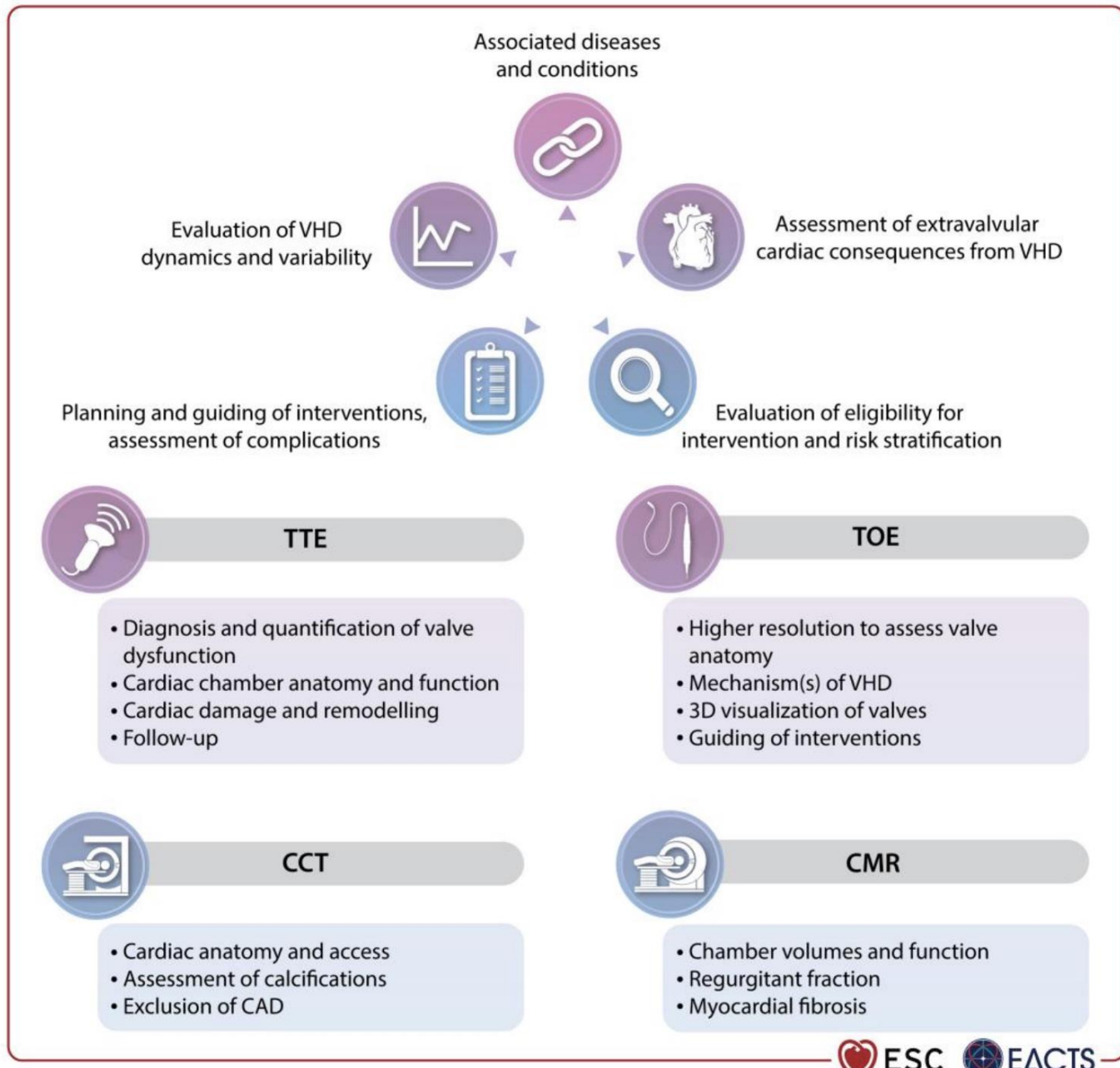
ESC GUIDELINES

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Figure 2

Integrative imaging assessment of patients with valvular heart disease



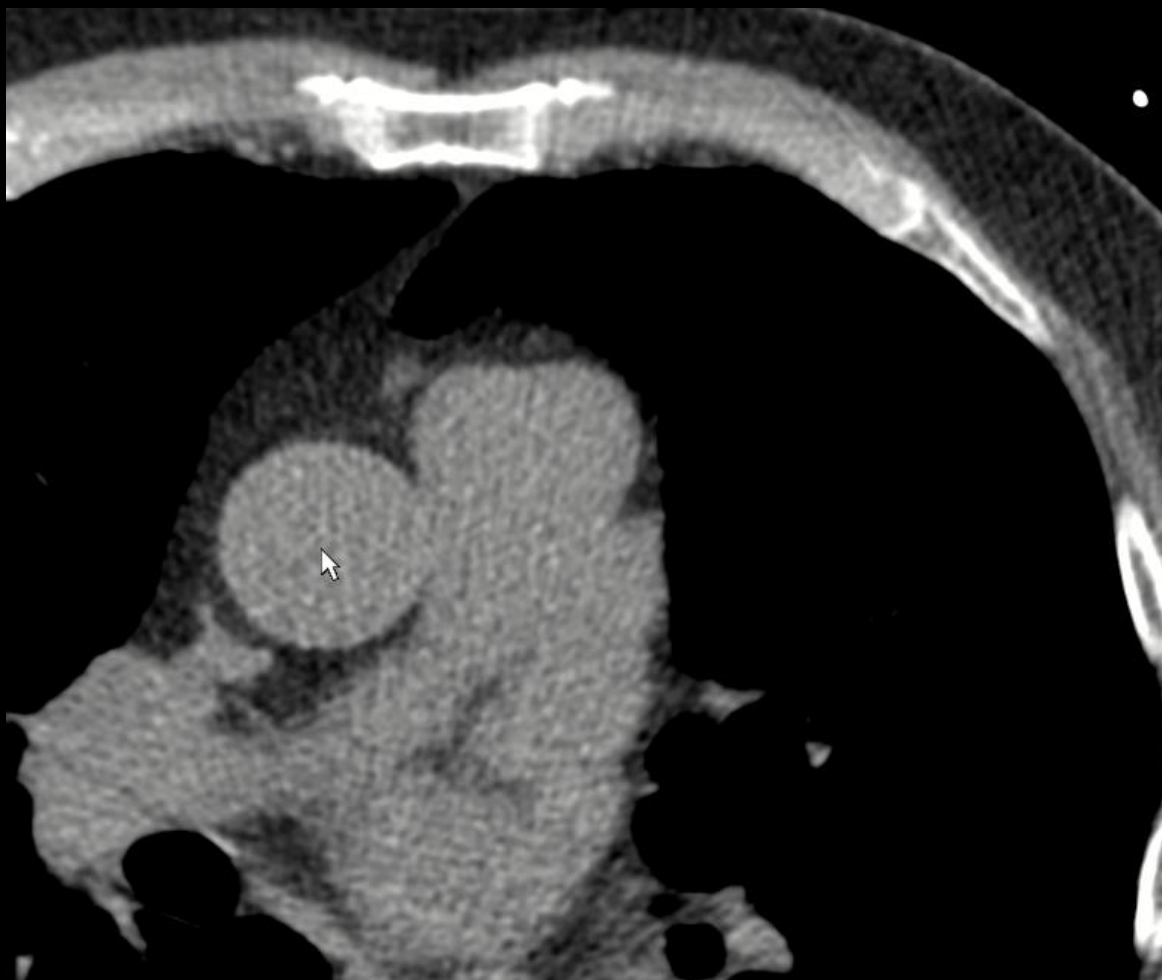
CT vid klaffsjukdom enligt guidelines

- Klaffens relation till närliggande strukturer (tex kranskärl)
- Utbredning av förkalkningar
- Storleksval av protes
- Arteriell och venös access
- Komplikationer (blödning, embolisering)
- Kranskärlsbedömning

Aortastenosis : calcium scoring av aortaklappen

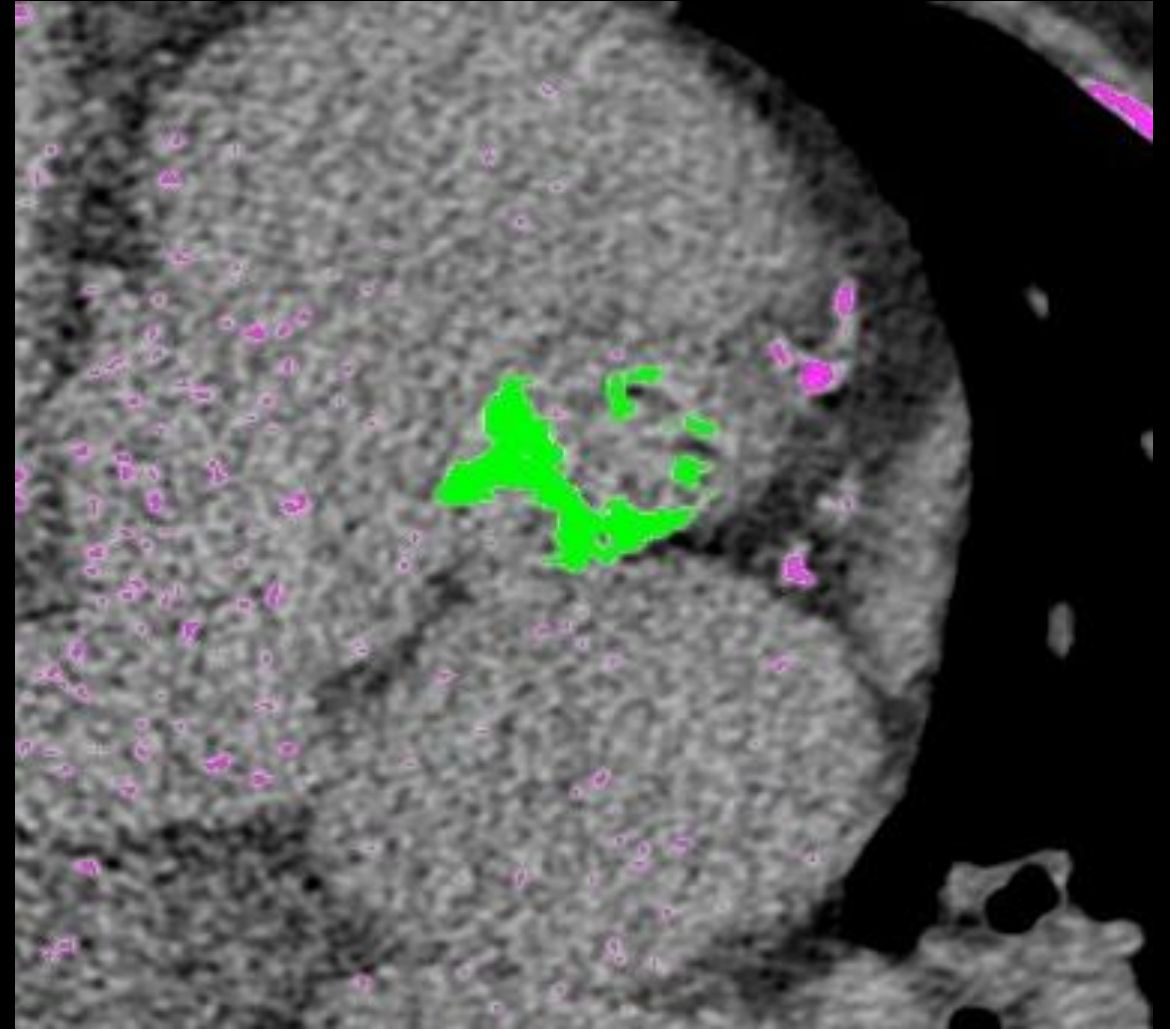
- Undersökning utan kontrast
- Vid low-flow, low-gradient AS
- Används som en pusselbit i samlad bedömning
- Calcium score >2000 AU för män och >1200 för kvinnor innebär hög sannolikhet för tät stenosis (85% sens och spec)
- OBS vissa tillstånd kan ge tät stenosis utan kraftiga förkalkningar tex BAV, amyloidos, fibrotisk stenosis vid inflammatorisk sjukdom

Calcium scoring

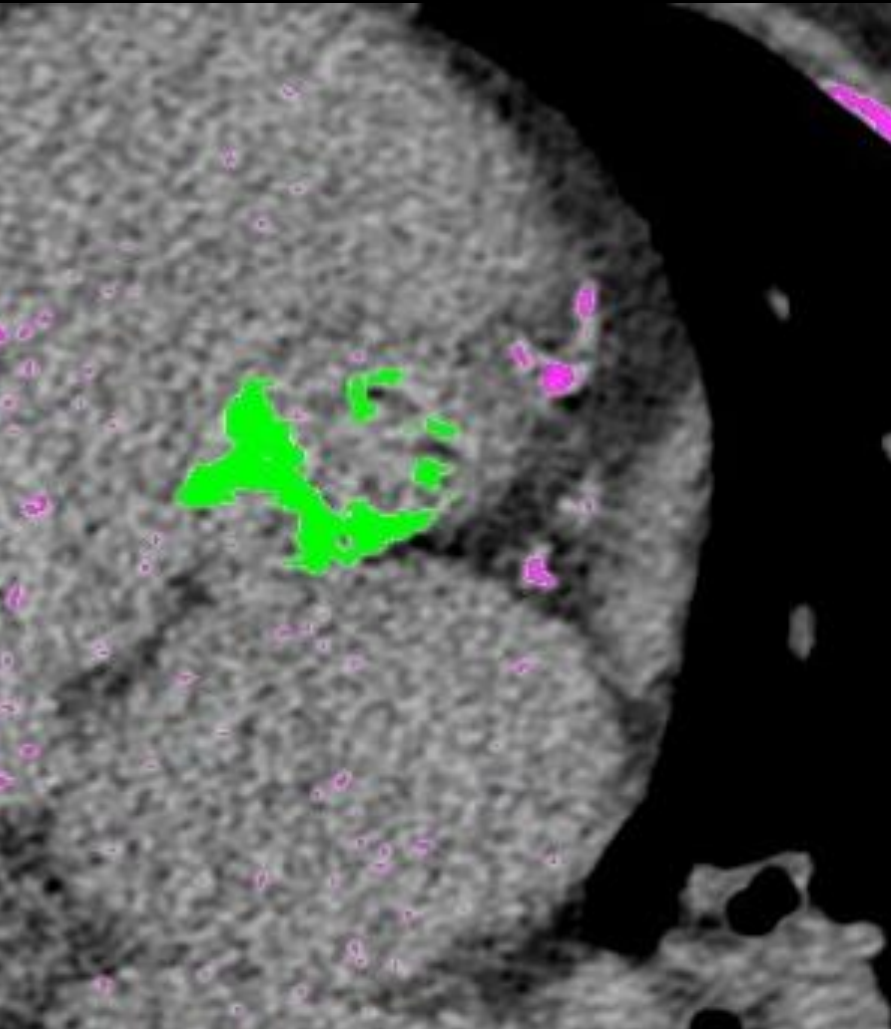


- 3 mm snitt
- Utan kontrast
- Med EKG-trigging

Calcium scoring av aortaklaff



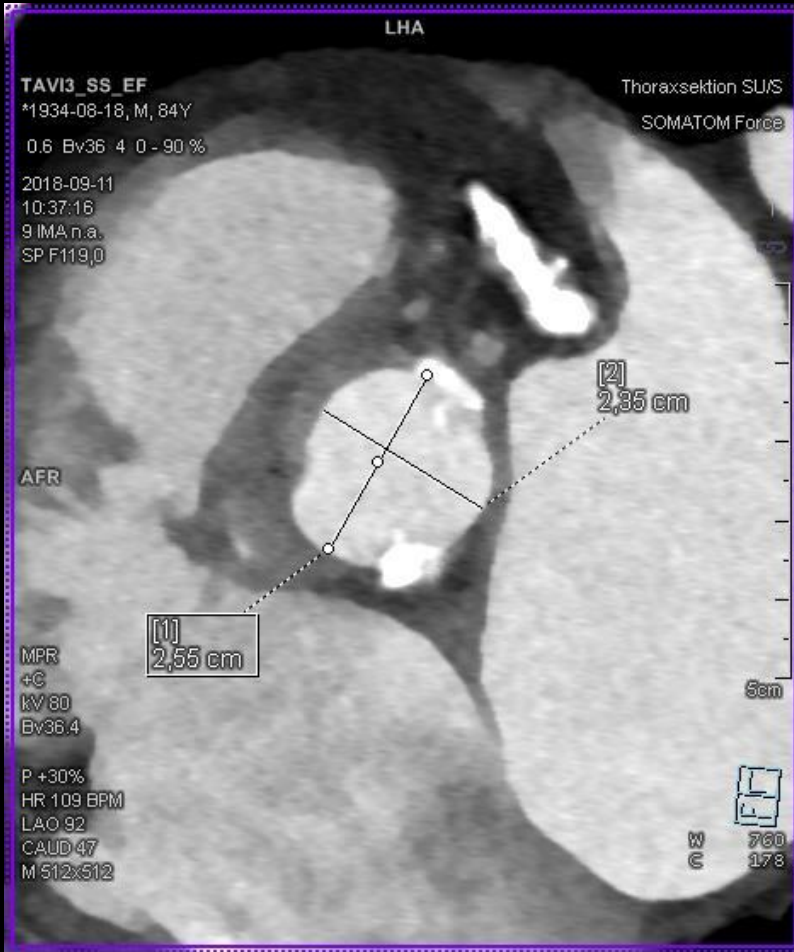
Calcium scoring av aortaklaff



Lesions	Volume / mm ³	Equiv. Mass / mg	Score
2	2595,9	561,88	3129,9
0	0,0	0,00	0,0
0	0,0	0,00	0,0
0	0,0	0,00	0,0
2	2595,9	561,88	3129,9

Aortastenosis – inför TAVI

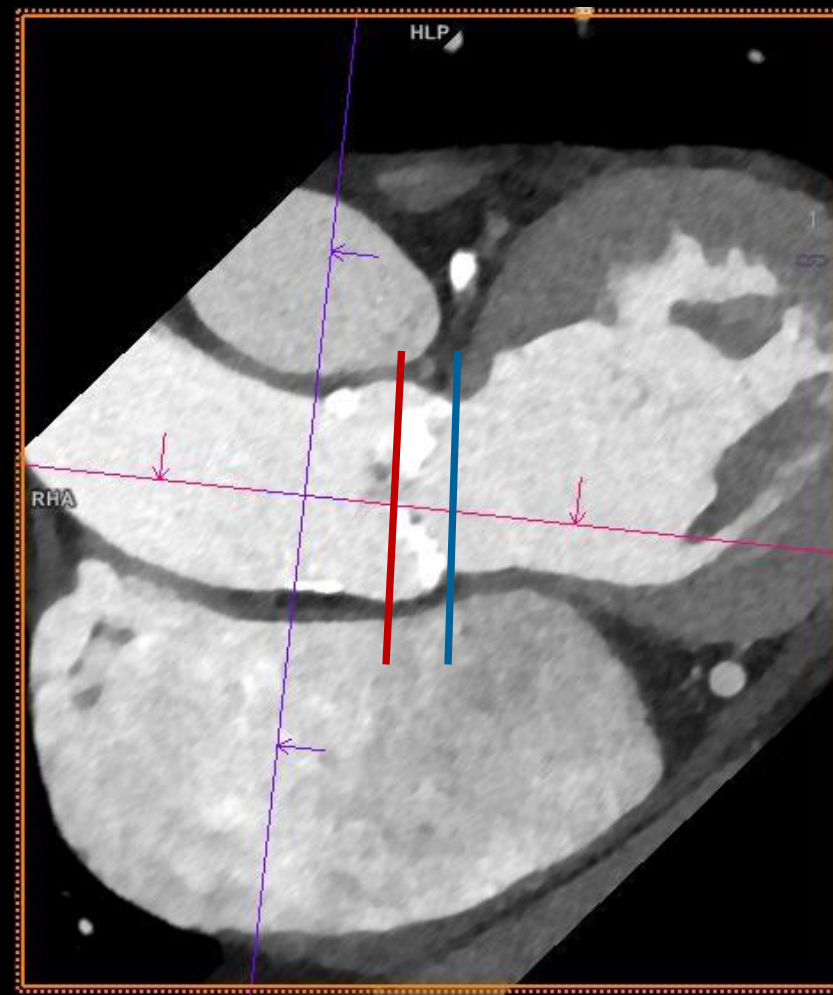




Anulus systole 30%
 24x28 mm
 omkrets 79 mm
 area 4,9 cm²



Sinus valsalva 30x33x34 mm

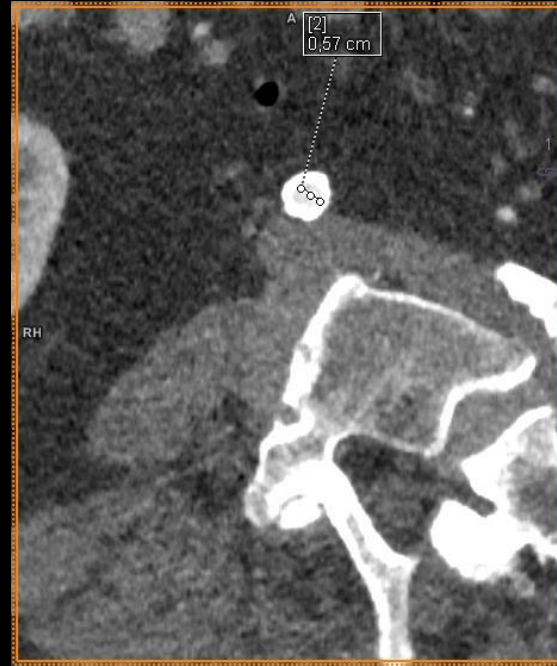
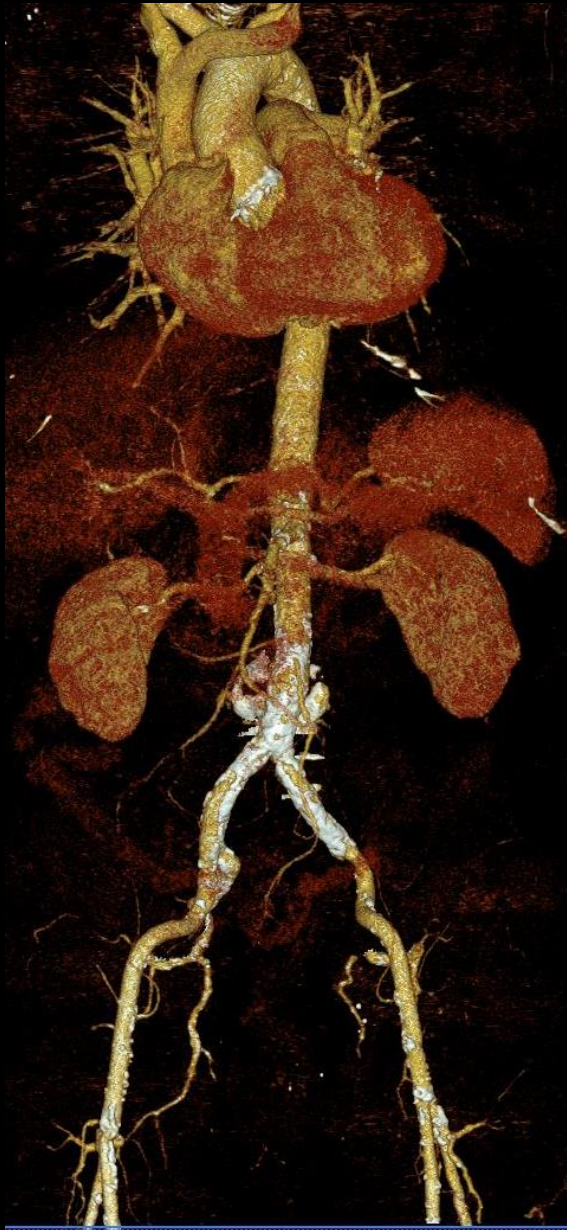




Anulus – hö kranskärl 15 mm



Anulus – vä kranskärl 9 mm



Hö iliaca 6 mm



Vä iliaca 5 mm

"Aorta är normalvid med trombotiska väggpålagringar i arcus och mer uttalade förkalkningar i distala bukaorta som sträcker sig ut i bäckenkärlen. Minsta diameter hö iliaca communis ca 6 mm, vä 5 mm. Hö subclavia mycket slingrig, vä ses utan stenoser och ingen påtaglig slingrighet.

Bedömning av kranskärlen inför TAVI med CT

- Sensitivitet 95-97%
- Specificitet 68-73%
- Problemet: ofta mycket kalk i kranskärlen

Omission of invasive coronary angiography should be considered in TAVI candidates, if procedural planning CT angiography is of sufficient quality to rule out significant CAD.^{125–129}

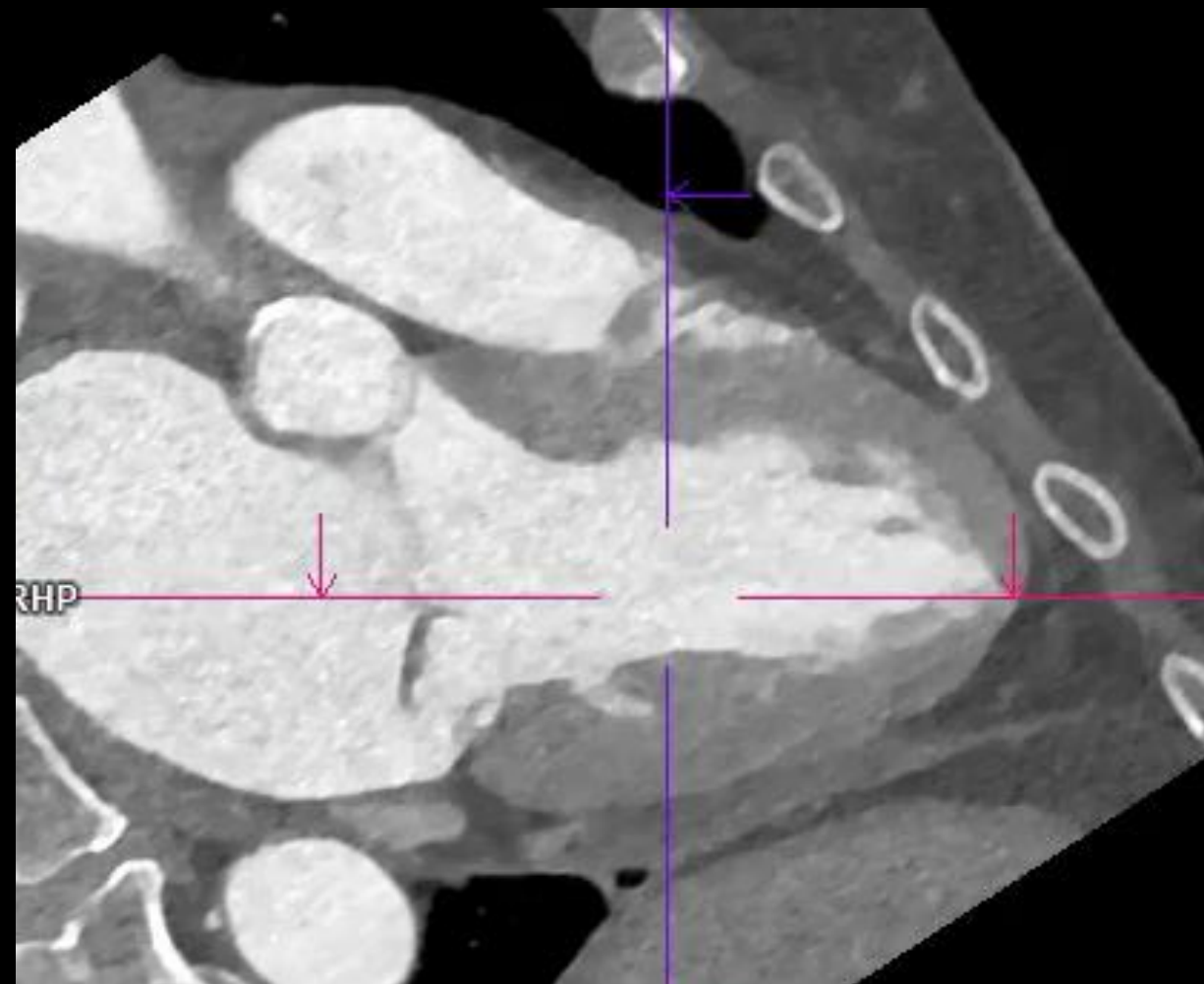
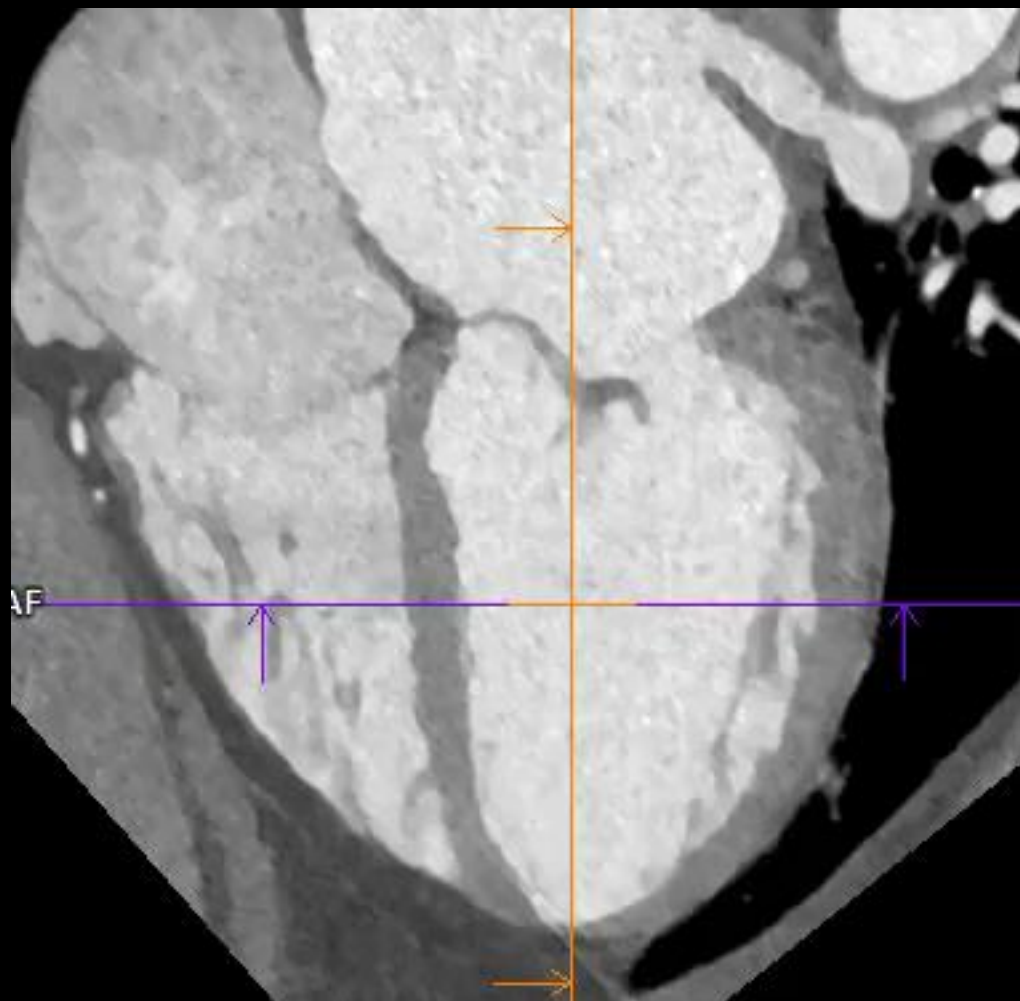
IIa

B

DT mitralklaff

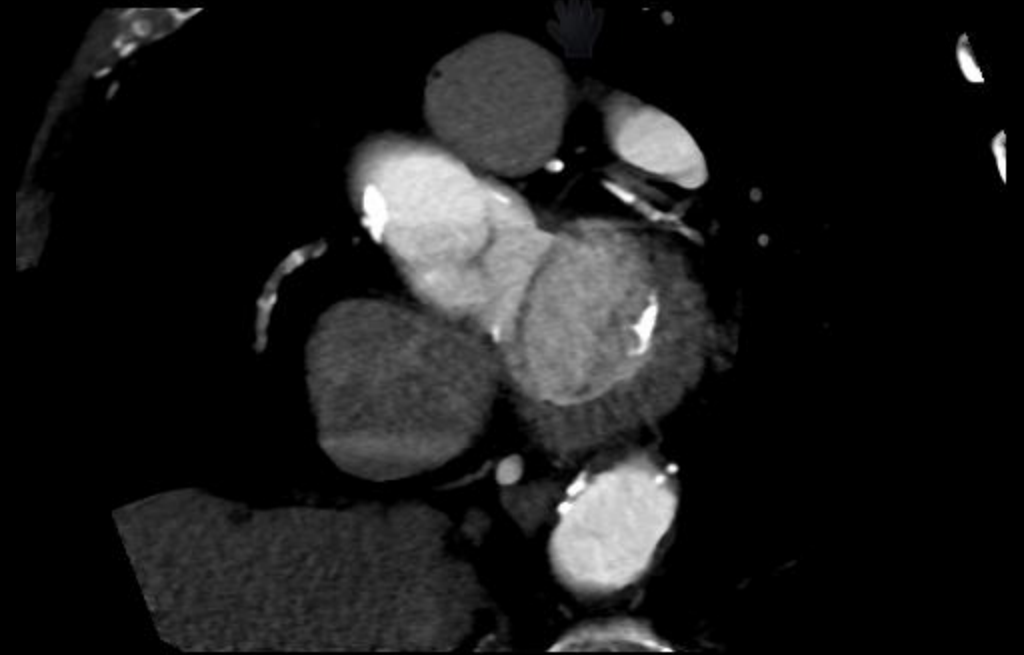
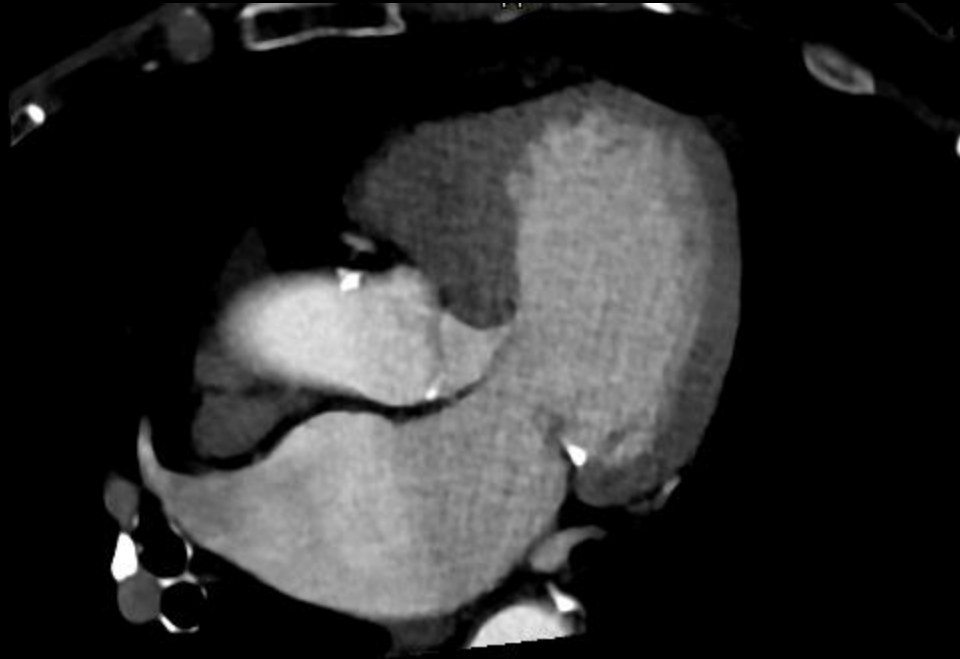
- Ökande användning i planering av interventioner
- Ger högupplösta bilder av klaffapparaten
- Bedömning inför TMVI
- Bedömning av MAC

Mitralutredning

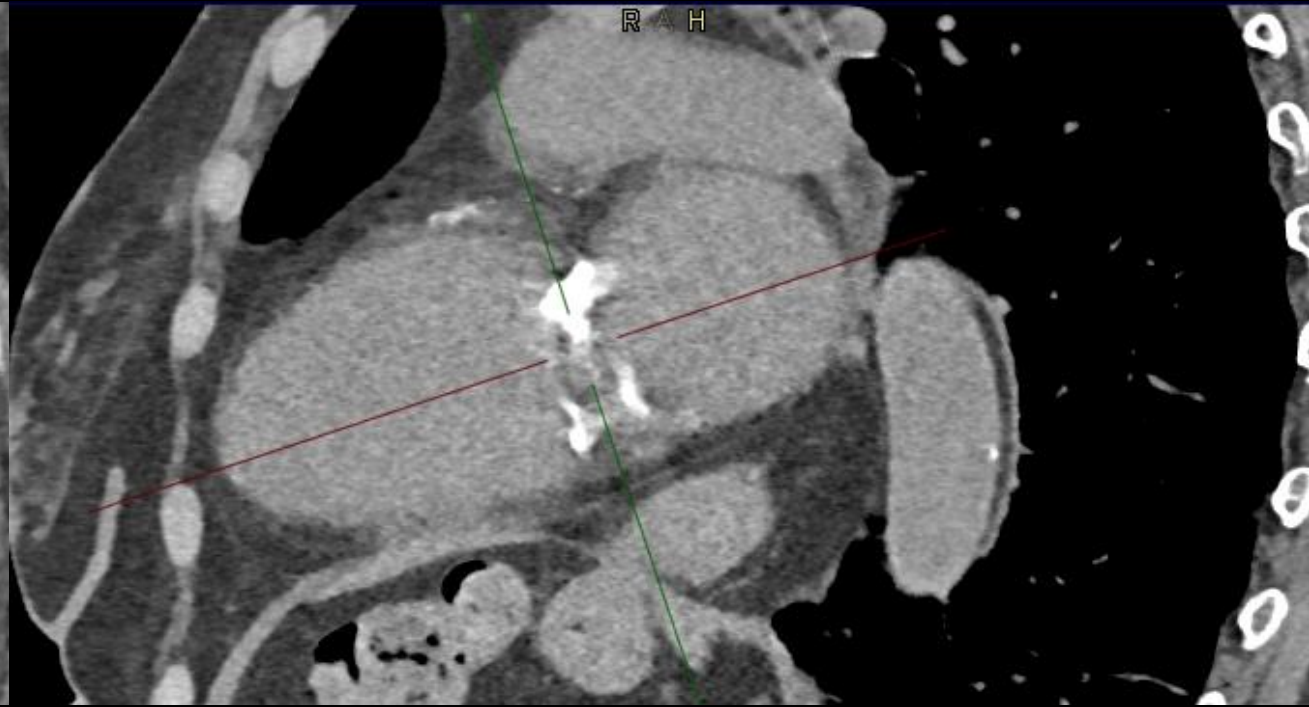
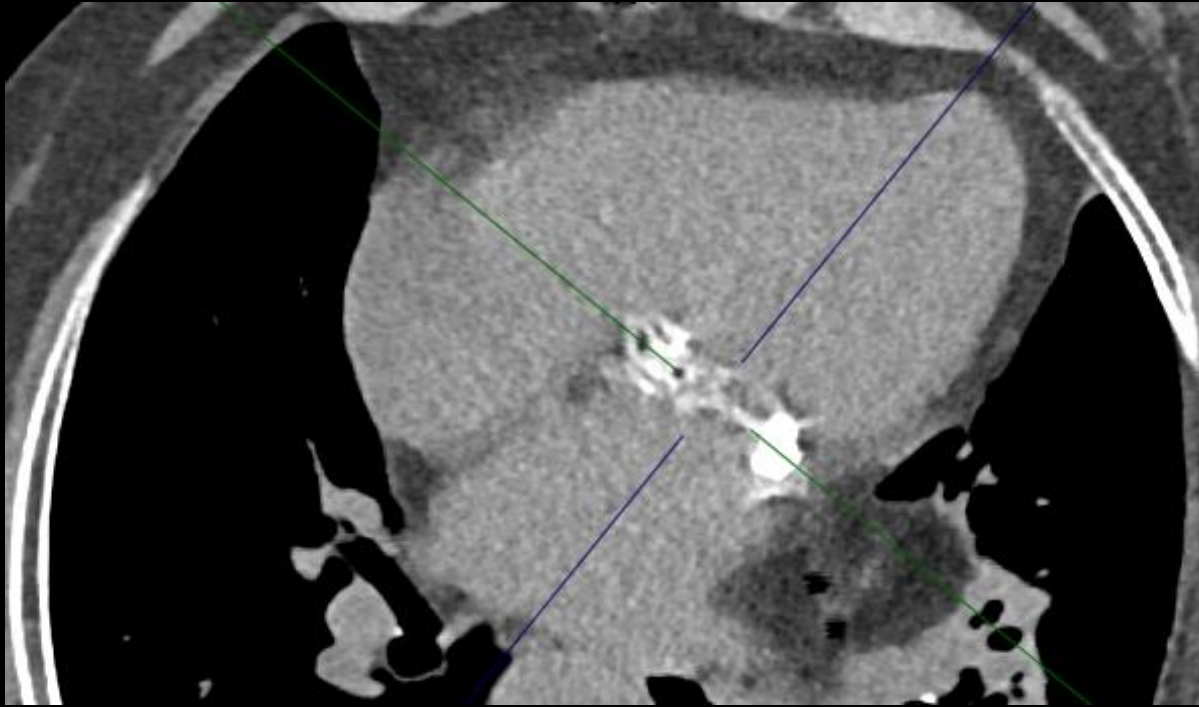




MAC – mitral annular calcifications



MAC – mitral annular calcifications

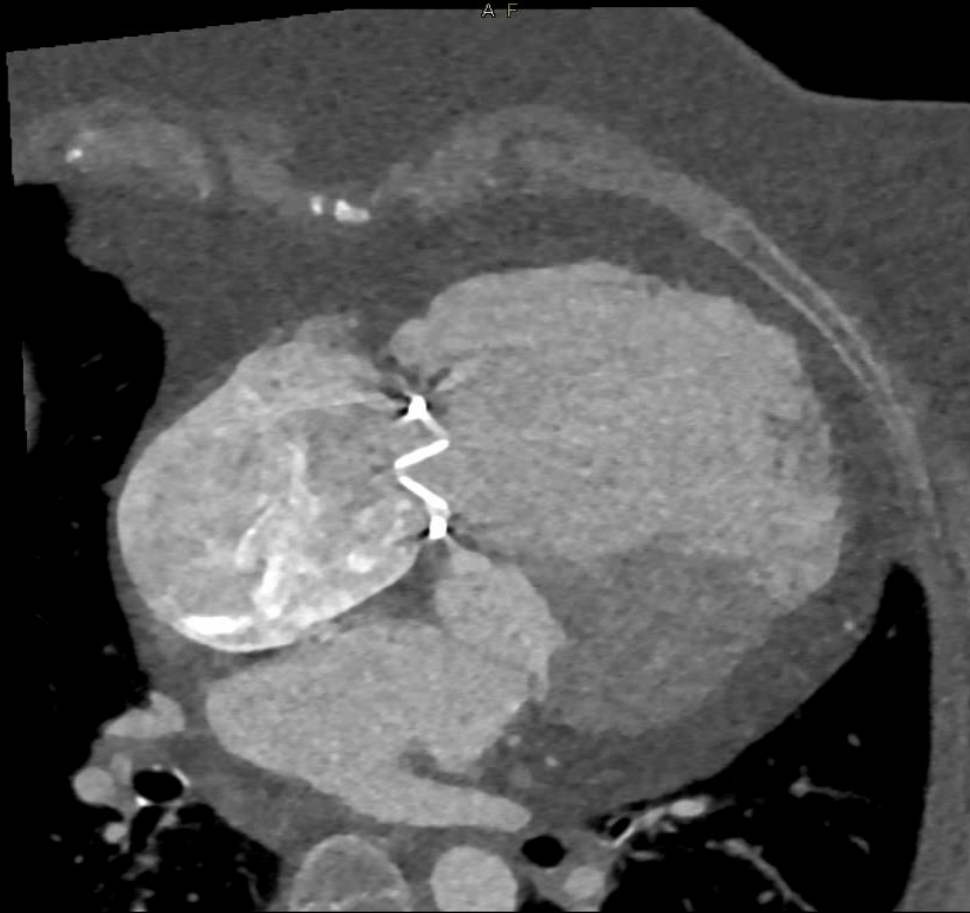


Högersidiga klaffar kräver särskilt kontrastprotokoll!



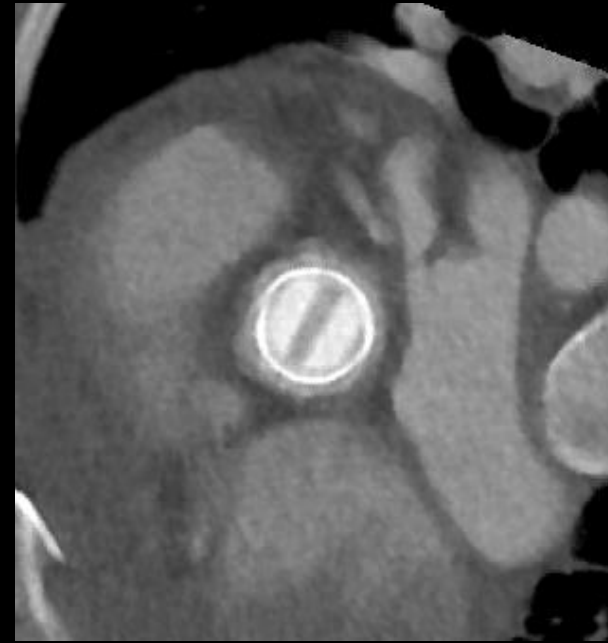
Electrocardiogram-gated CCT with dedicated protocols ensuring sufficient contrast enhancement of the right heart cavities provides detailed characterization of the RA, RV, and vena cava anatomy, the location of the right coronary artery, and is crucial to assess suitability and device sizing for several transcatheter interventions.^{689,697}

Filming av klaffprotes med CT

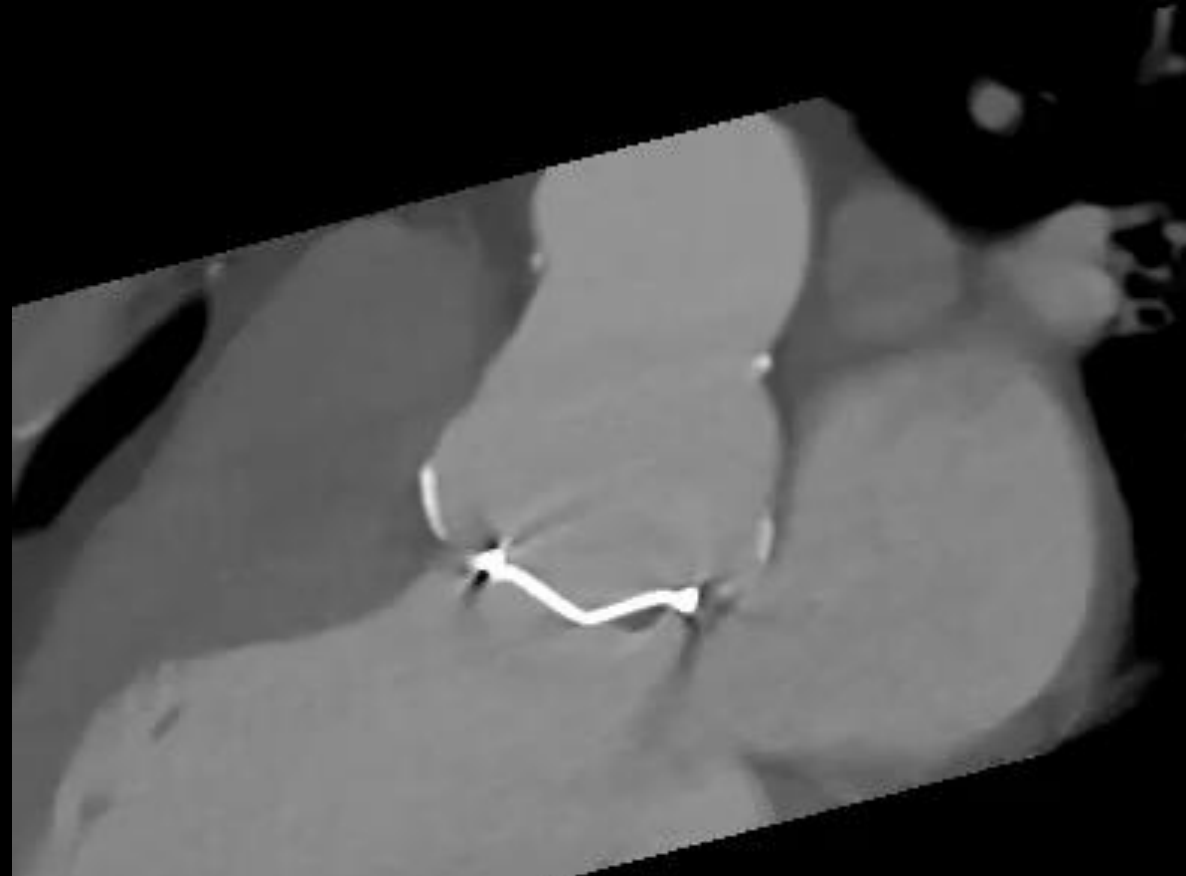


- Retrospektiv undersökning
- Kontrast inte nödvändigt

Normal klaffproteses



Tromb/pannus?



Klaffdiagnostik med datortomografi

- CT-teknik
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Protokoll DT hjärta vid endokardit

- Retrospektiv undersökning – hela hjärtcykeln
- Kontrast i alla hjärtrum - tvåfas
- Inled med serie utan kontrast för att skilja kirurgiskt material från kontrast
- Betablockad och nitro används oftast inte

Definitions of the 2023 European Society of Cardiology modified diagnostic criteria of infective endocarditis (2)

Major criteria (continued)

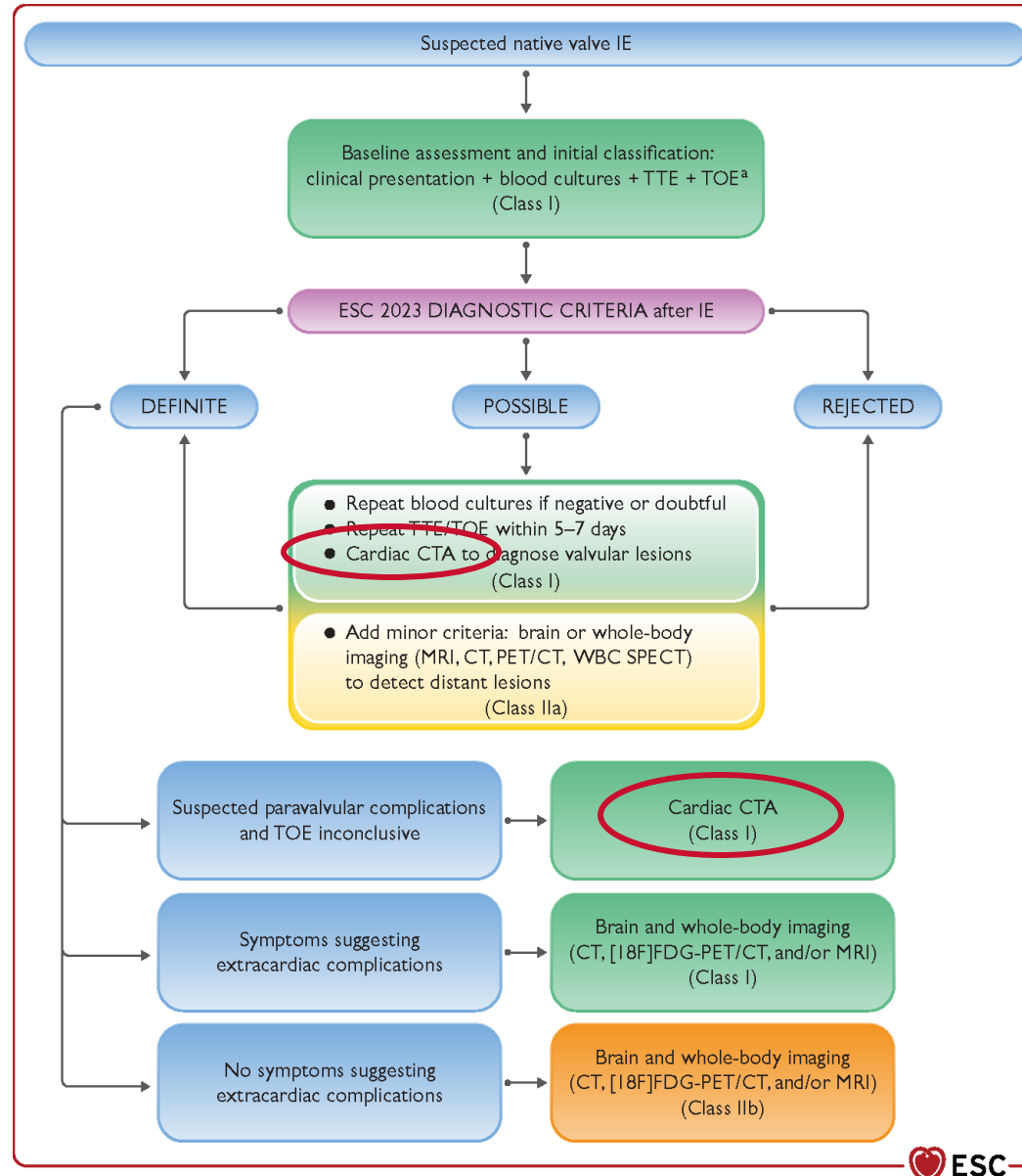
(ii) Imaging positive for IE

Valvular, perivalvular/periprosthetic and foreign material anatomic and metabolic lesions characteristic of IE detected by any of the following imaging techniques:

- Echocardiography (TTE and TOE)
- Cardiac CT
- [18F]-FDG-PET/CT(A)
- WBC SPECT/CT

Figure 5

European Society of Cardiology 2023 algorithm for diagnosis of native valve infective endocarditis



Endokardit - fynd vid DT hjärta

- Vegetationer

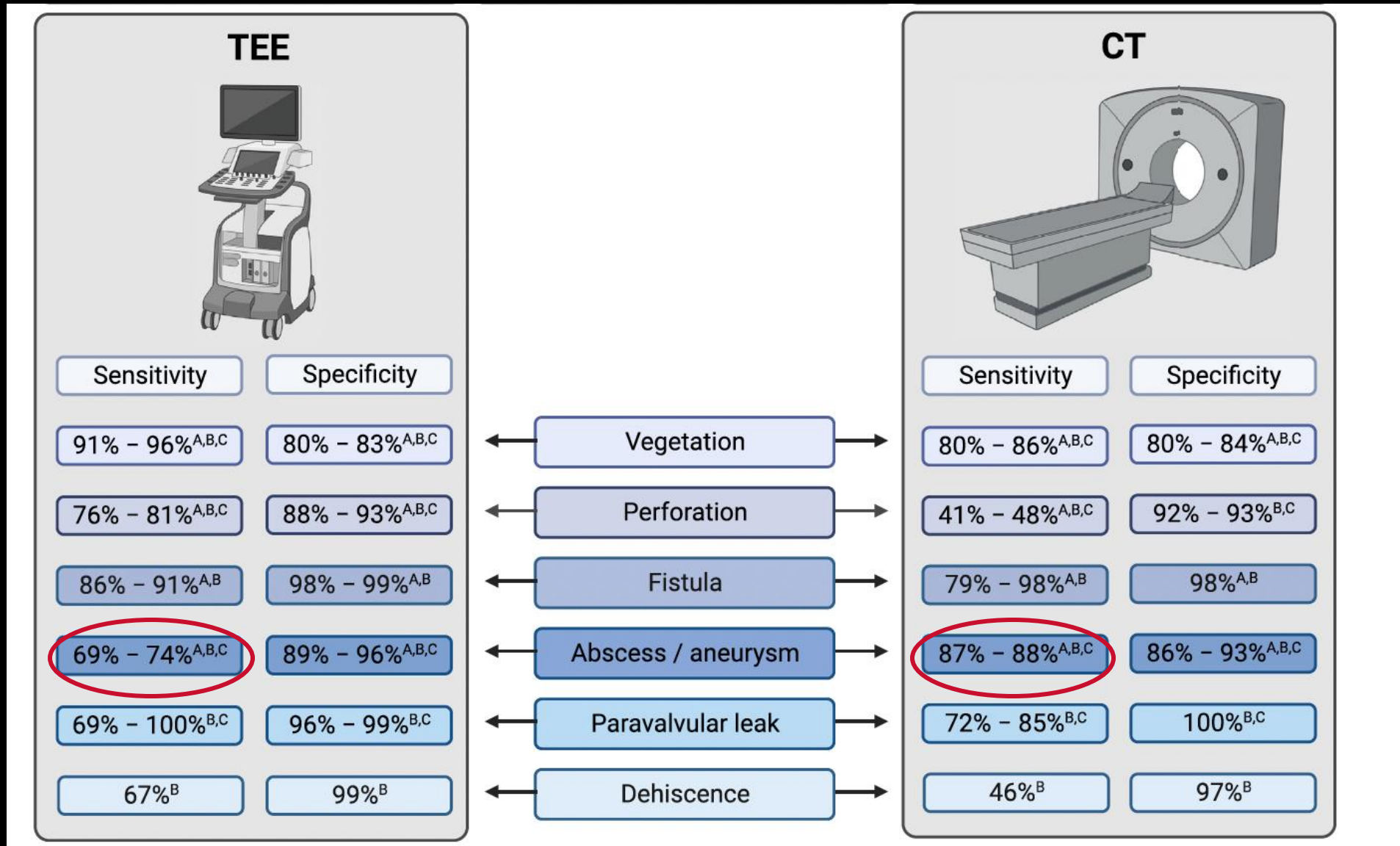
- Ökad vägg tjocklek i aortaroten (>5 mm)

- Pseudoaneurysm / tömda abscesser

- Fistlar

- Proteslossning / paravalvulärt läckage

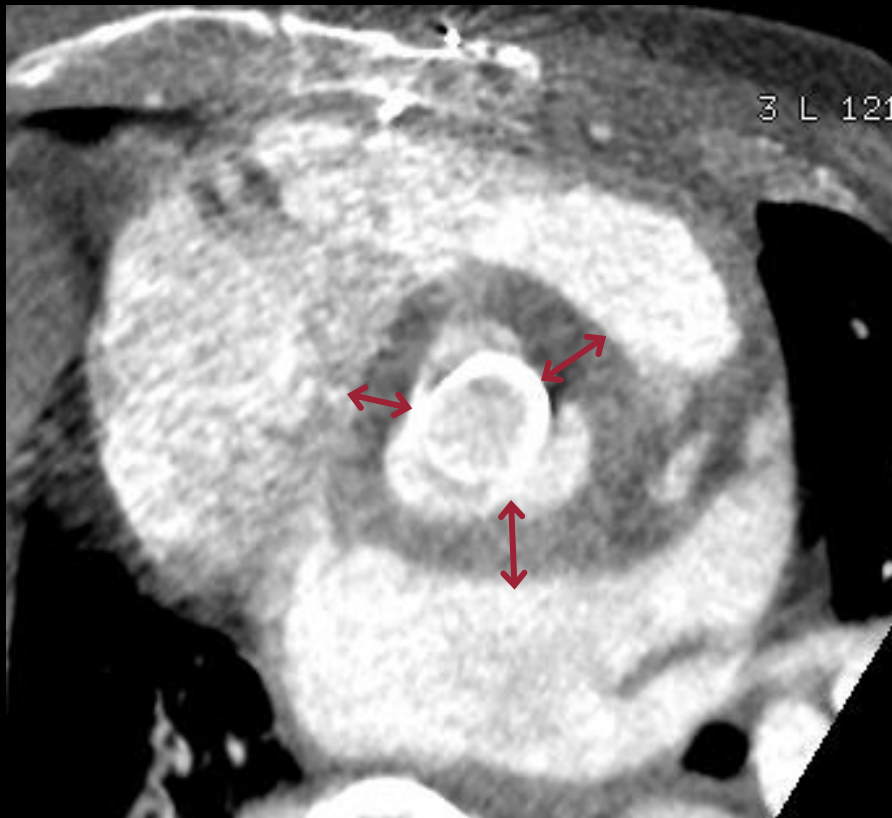
DT hjärta



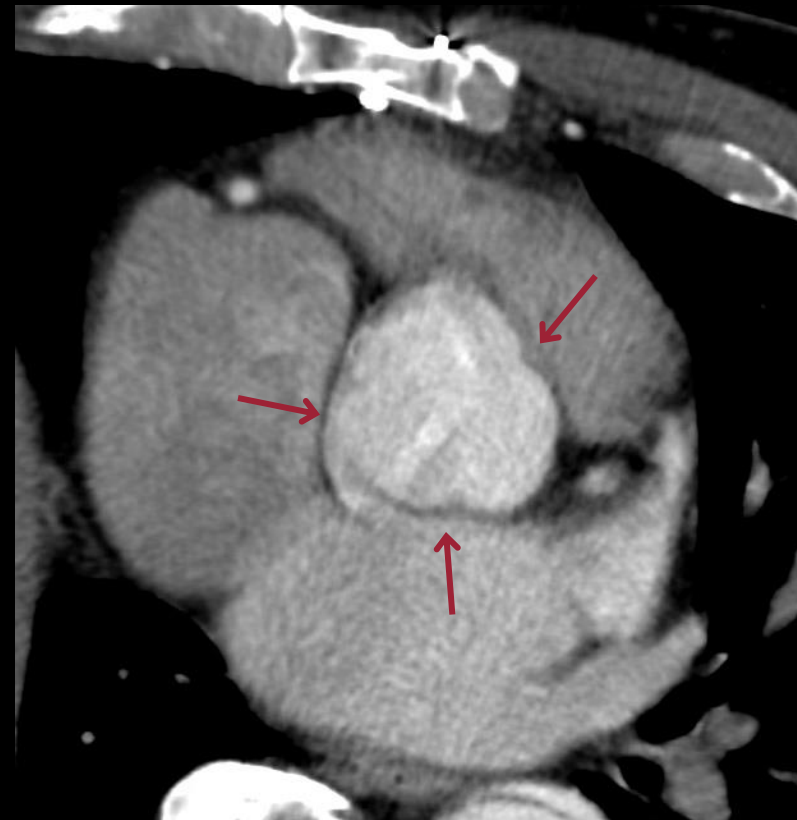
DT hjärta vid endokardit - vegetation



Ökad vägg tjocklek i aortaroten

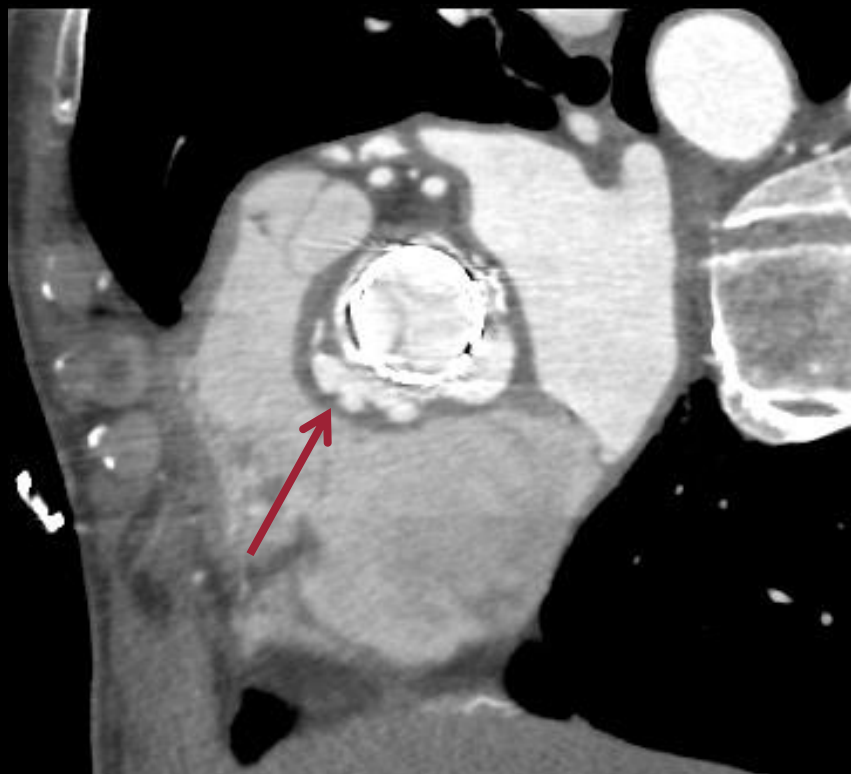


EKG-styrd DT



DT 6 veckor tidigare

Pseudoaneurysm

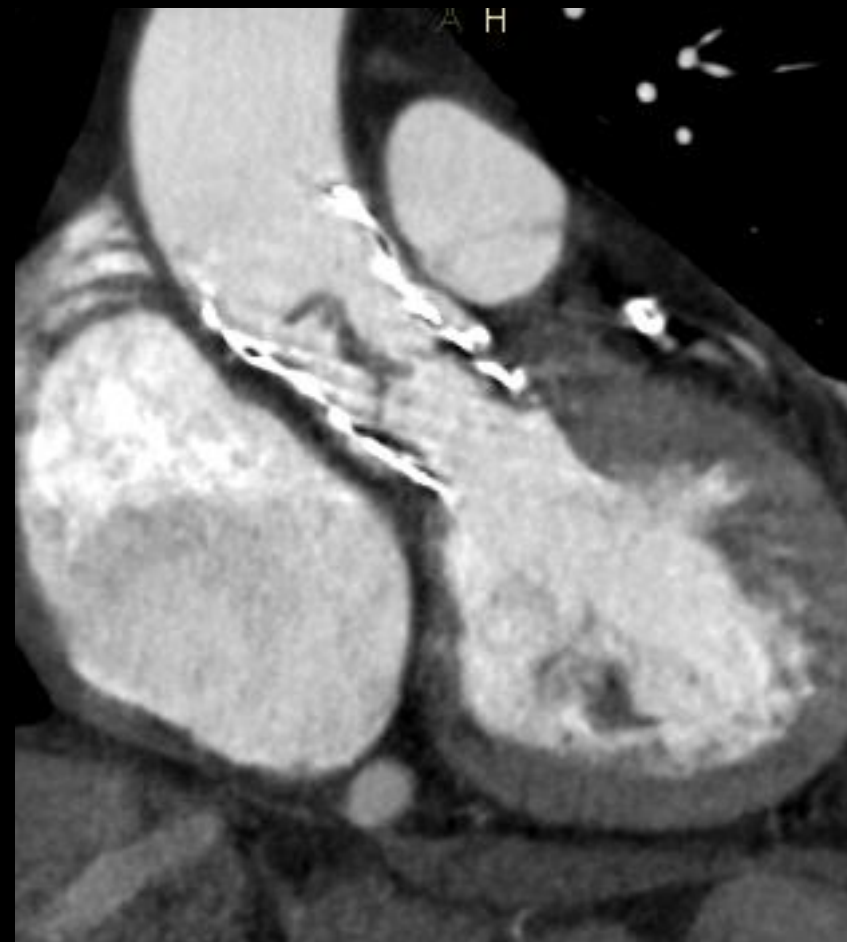


Transaxial bild på klaffen



3-kammarvy

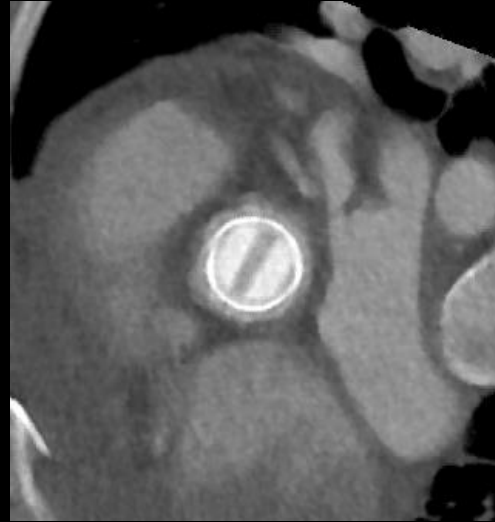
Protesendokardit i TAVI-klaff



När har DT hjärta störst värde?

- Protesendokardit
 - ökad risk för paravalvulärt engagemang
 - TEE har lägre sensitivitet
- Kartlägga utbredning av infektion
- Preoperativ planering inklusive kranskärl

Tack!



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