Challenging Situations: LV Dysfunction

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Disclosure

- Consultant and proctor to Edwards, Boston, St Jude.
- Clinical trial arrangements with Edwards, Boston, St Jude, Abbott, Symentis, Medtronic.

Case Study

Age:	83	years
Gender:	M	
Height:	171	cm
Weight:	60	kg
BMI:	20.5	kg/m^2
Resides:	Lives with wife	

Medical history I

- **Symptoms- NYHA 2**
- **Aortic stenosis - low flow low gradient**
  - **diffuse thickening AV + reduced leaflet excursion**
  - **AVA 1cm2, Vmax 3.5, MPG 32mmHg**
- **PBAV 14/10/15**
  - **gradient fell from 25 mmHg to 12 mmHg**
- **Left ventricular function**
  - EF 30%

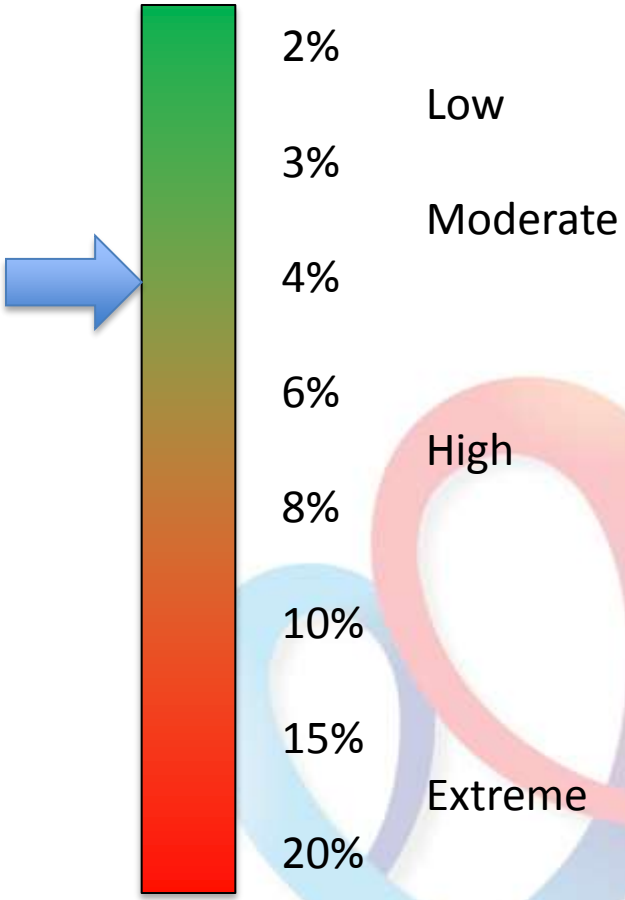
Medical history II

- Coronary artery disease- IHD , CABG 2000 (LIMA LAD, SVG RPDA, SVG Ramus)
- Cerebrovascular disease –nil
- Peripheral vascular disease – nil
- Respiratory disease – mild airflow obstruction, impaired gas transfer (FEV1 77% , FVC 94% DLCO 47% , KCP 66%)
- Renal disease – nil
- GI/haematological/bleeding – GORD
- Other – hernia operation, rheumatoid arthritis,

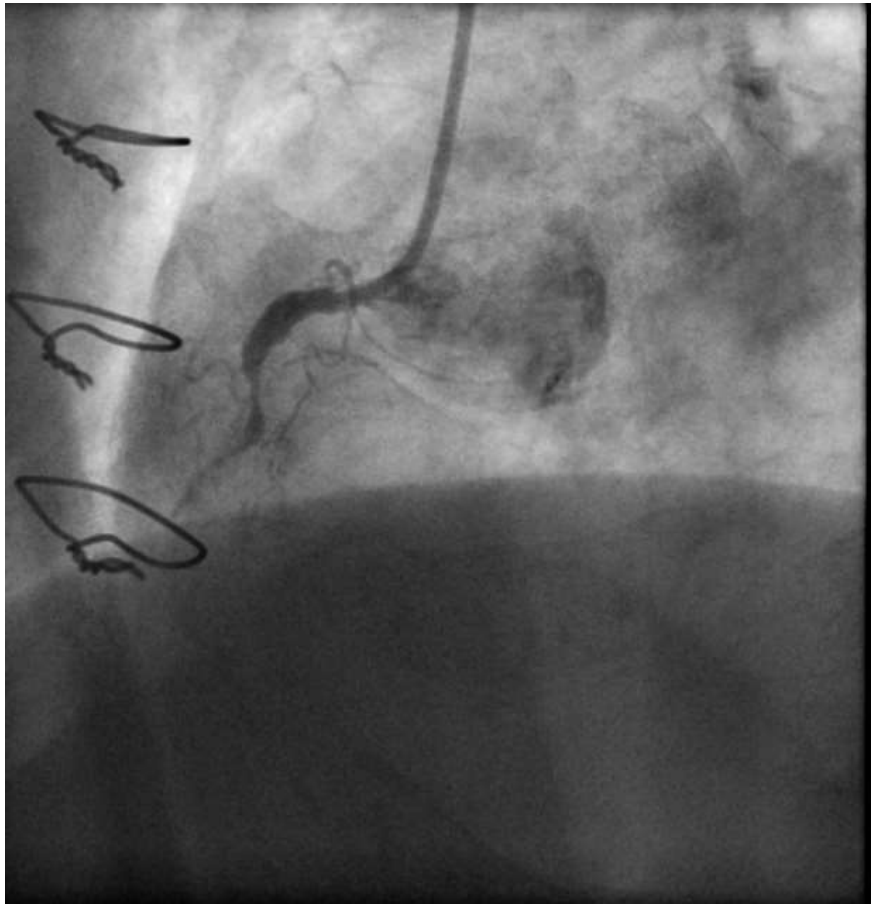
Surgical Risk Scores

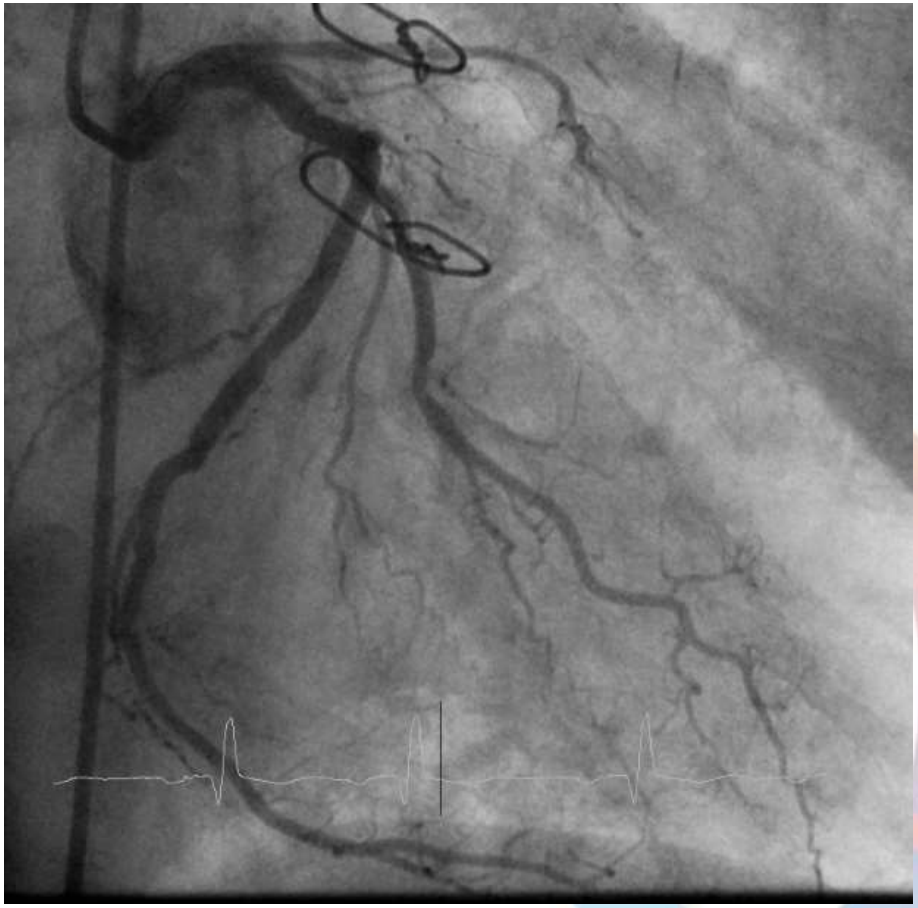
- STS mortality 4.1%
- STS morbidity and mortality 22.7%

- Euroscore logistic 50%
- Euroscore II 8.2%

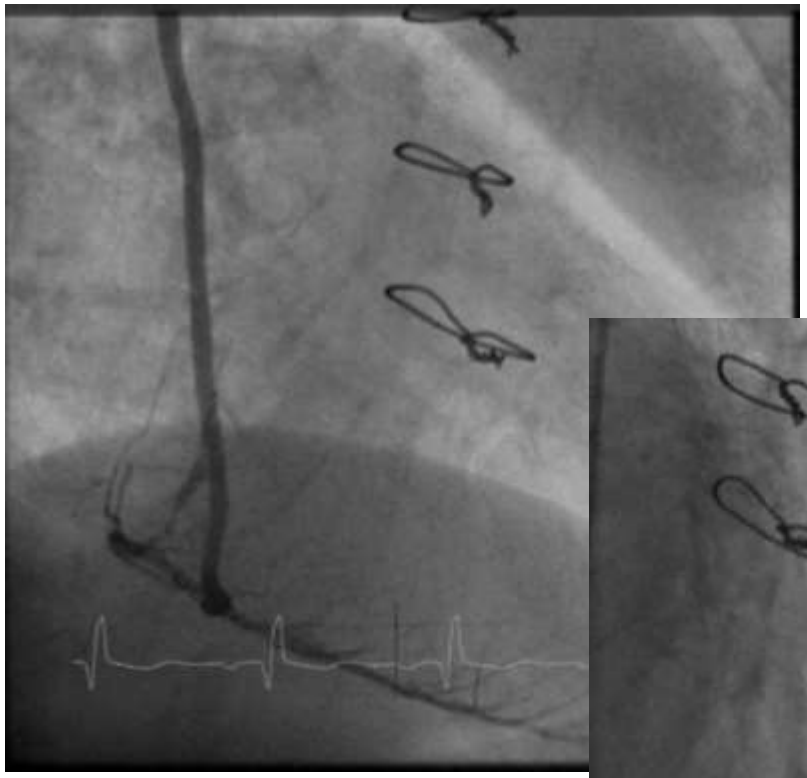


Coronary Artery Evaluation

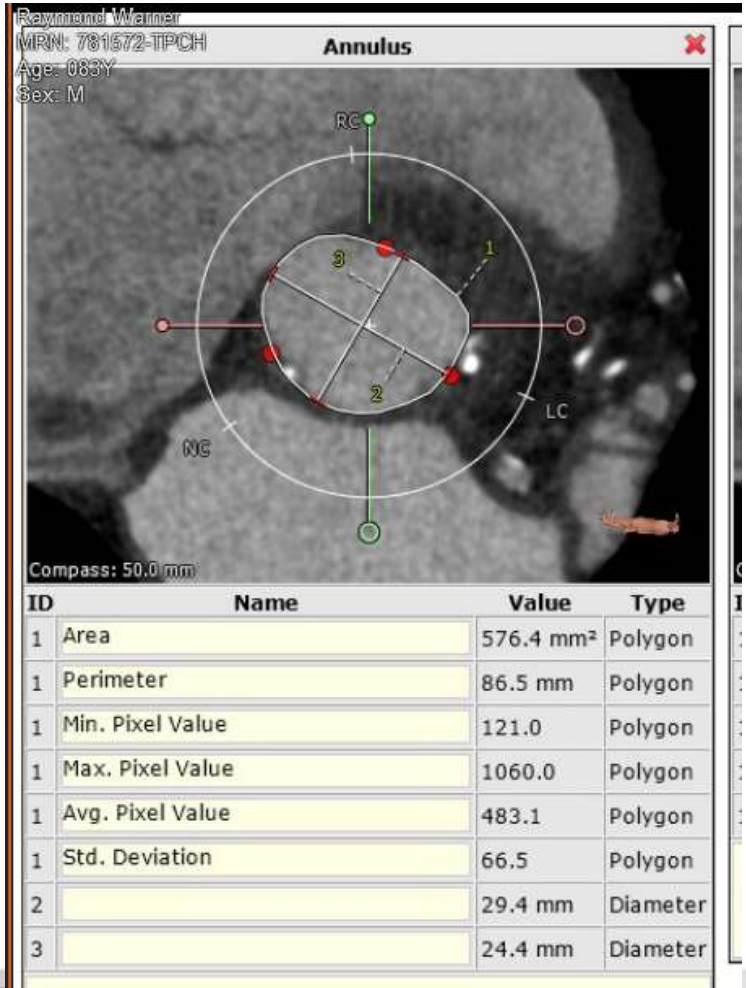




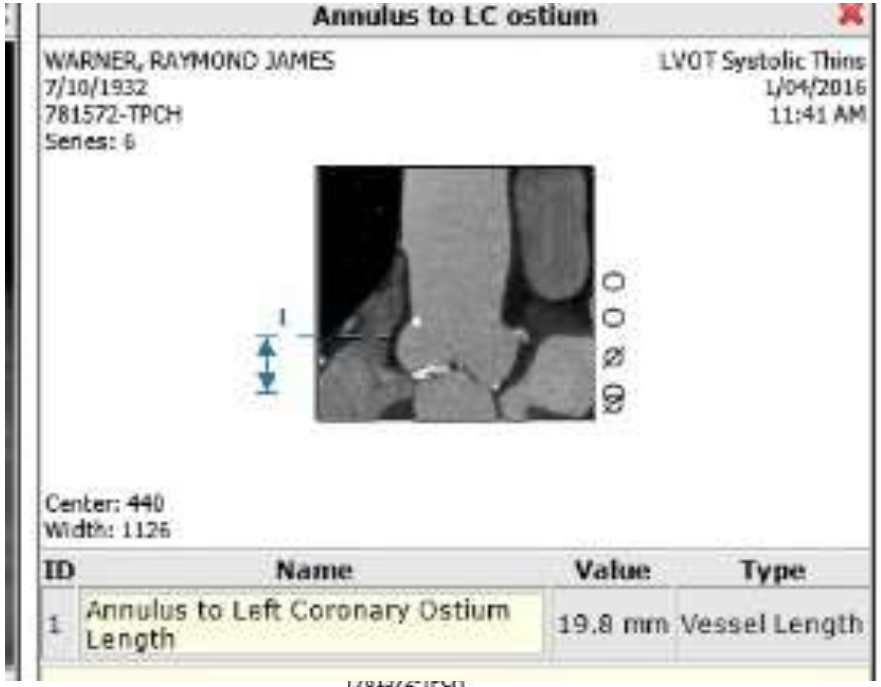
Graft study



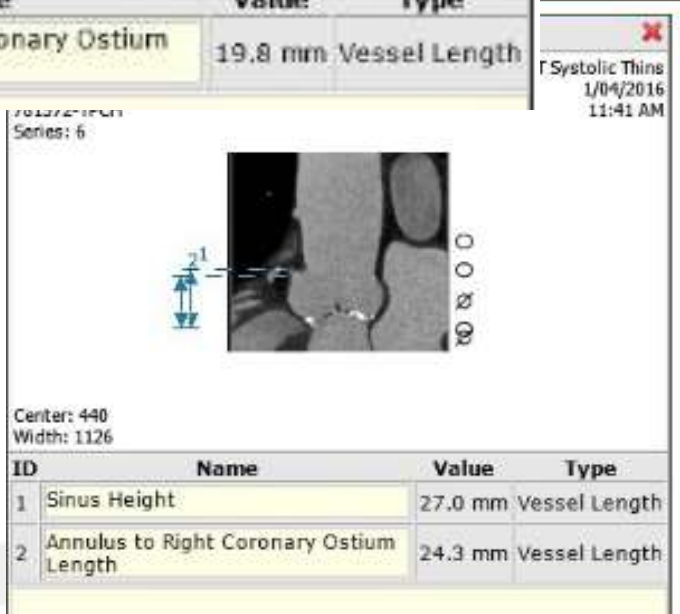
CT Valve Evaluation



ID	Name	Value	Type
1	Area	576.4 mm²	Polygon
1	Perimeter	86.5 mm	Polygon
1	Min. Pixel Value	121.0	Polygon
1	Max. Pixel Value	1060.0	Polygon
1	Avg. Pixel Value	483.1	Polygon
1	Std. Deviation	66.5	Polygon
2		29.4 mm	Diameter
3		24.4 mm	Diameter



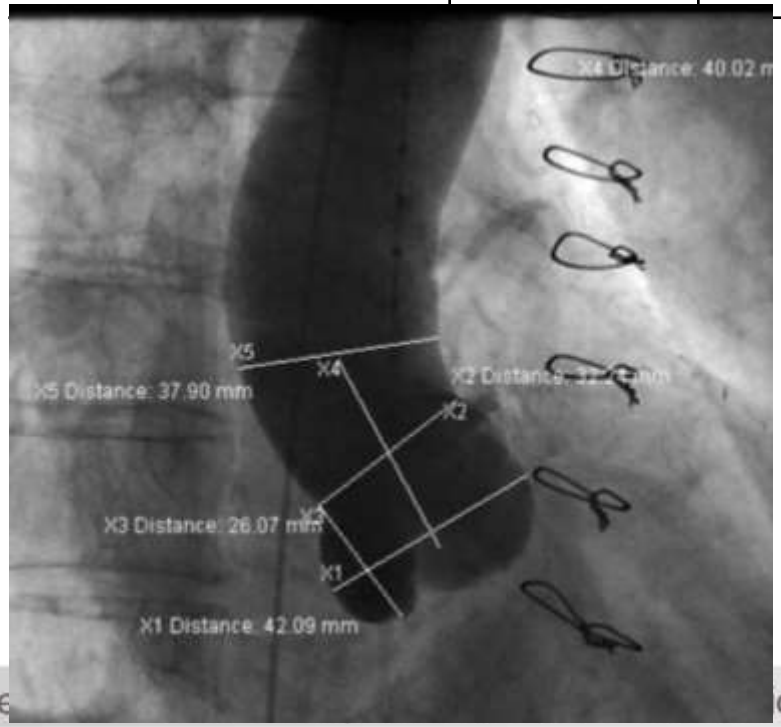
ID	Name	Value	Type
1	Annulus to Left Coronary Ostium Length	19.8 mm	Vessel Length



ID	Name	Value	Type
1	Sinus Height	27.0 mm	Vessel Length
2	Annulus to Right Coronary Ostium Length	24.3 mm	Vessel Length

Aortic Evaluation

Calcified bulky leaflets?		Distance coronary ostia – annulus (≥10mm)	Right 24.3mm Left 19.8mm
Horizontal aorta?		Define optimum view (3 leaflets aligned)	
Porcelain aorta?			



Peripheral Access Evaluation

Right

Minimum diameter by angio
7.3mm

Minimum diameter by CT
8mm

Left

Minimum diameter by angio
6.7mm

Minimum diameter by CT
9mm

Challenging case of LV dysfunction

- How do we establishing the diagnosis?
- Is the risk of procedure increased?
- Will the ventricle recover post TAVI?
- What is the prognosis without TAVI ?
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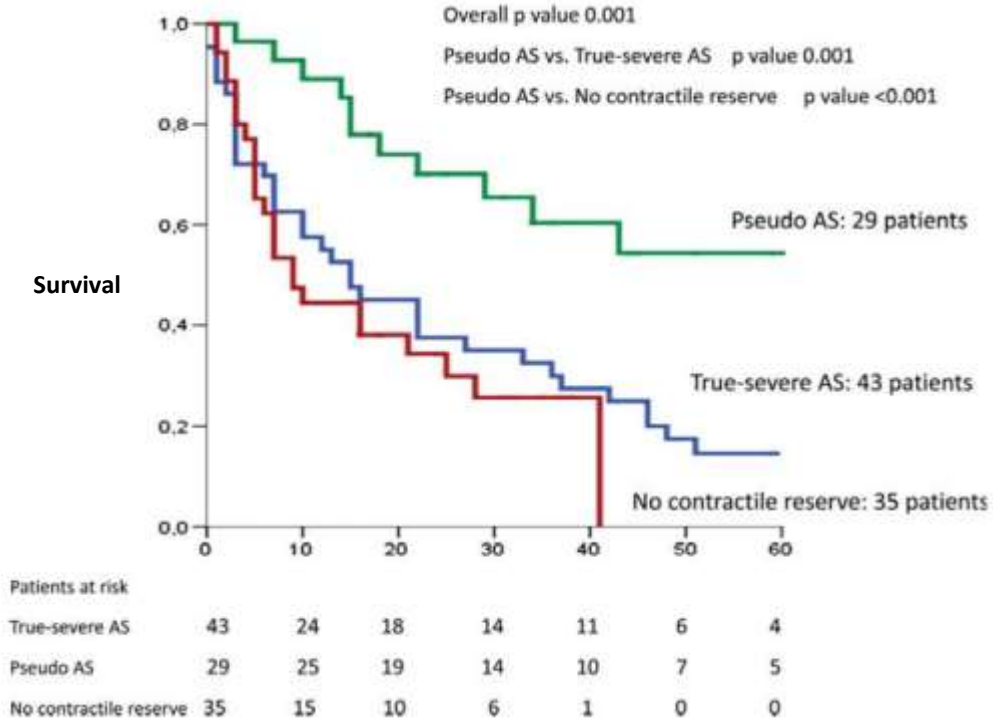
Low gradient, low EF AS

the importance of differentiation from pseudosevere AS



N = 107 patients managed conservatively (out of 305 from European LF, Low EF AS registry)
MPG<40mmHG, LVEF<40%,AVA<1.0cm2.

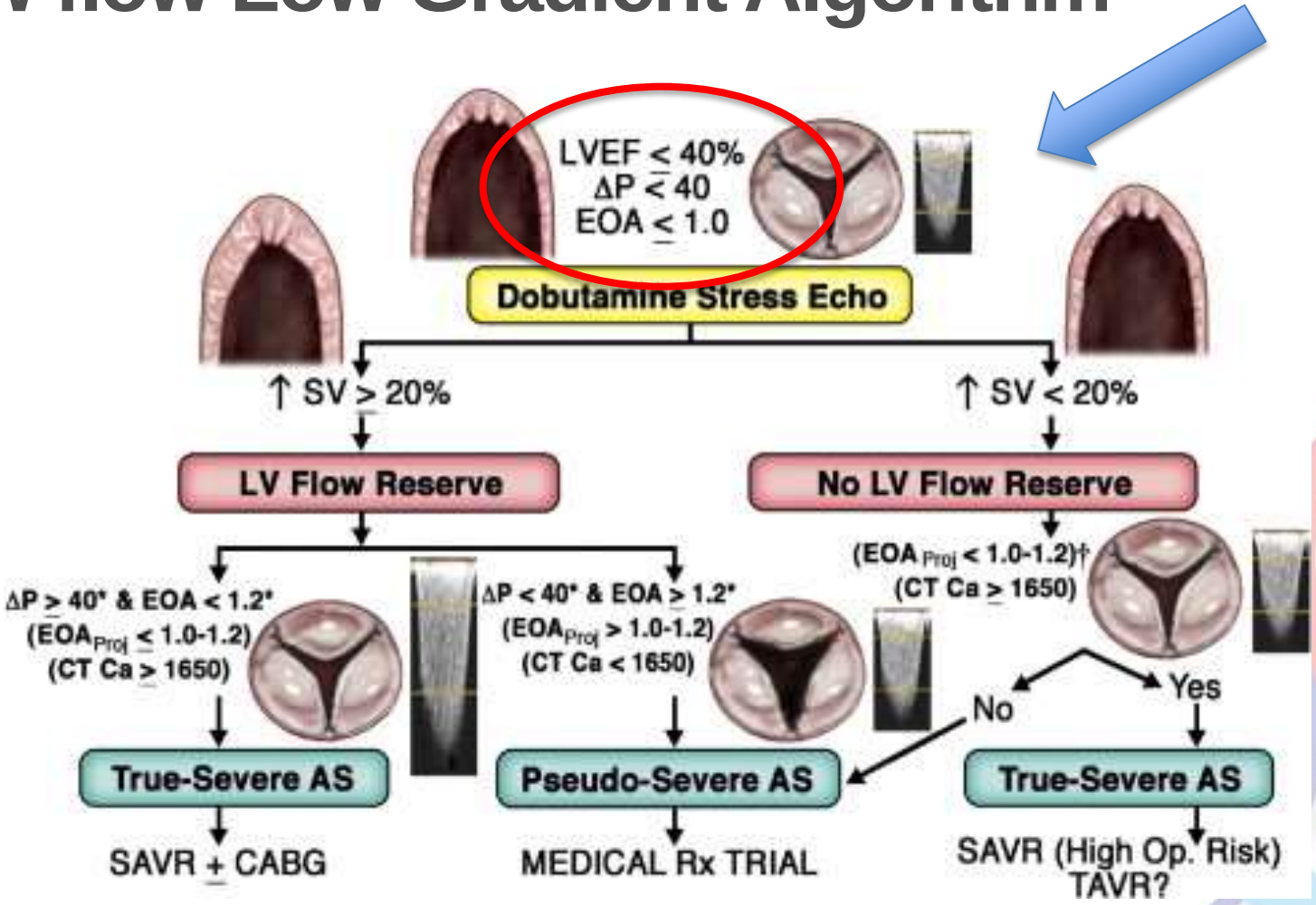
Pseudosevere AS shown to have low event rate out to 5 years, in comparison to the poor outcomes seen with untreated severe AS or severe AS with no CR

Fougeres et al. Eur Heart J 2012;33:2426-2433

Low gradient, low EF AS

- Important to Identify true severe aortic stenosis from pseudo-severe aortic stenosis
- Untreated mortality is high
- Treated either by surgery or TAVI prognosis improved

Low flow Low Gradient Algorithm



Dobutamine Echo 8/10/15

1. **Resting echo:**

Severe LV systolic dysfunction.

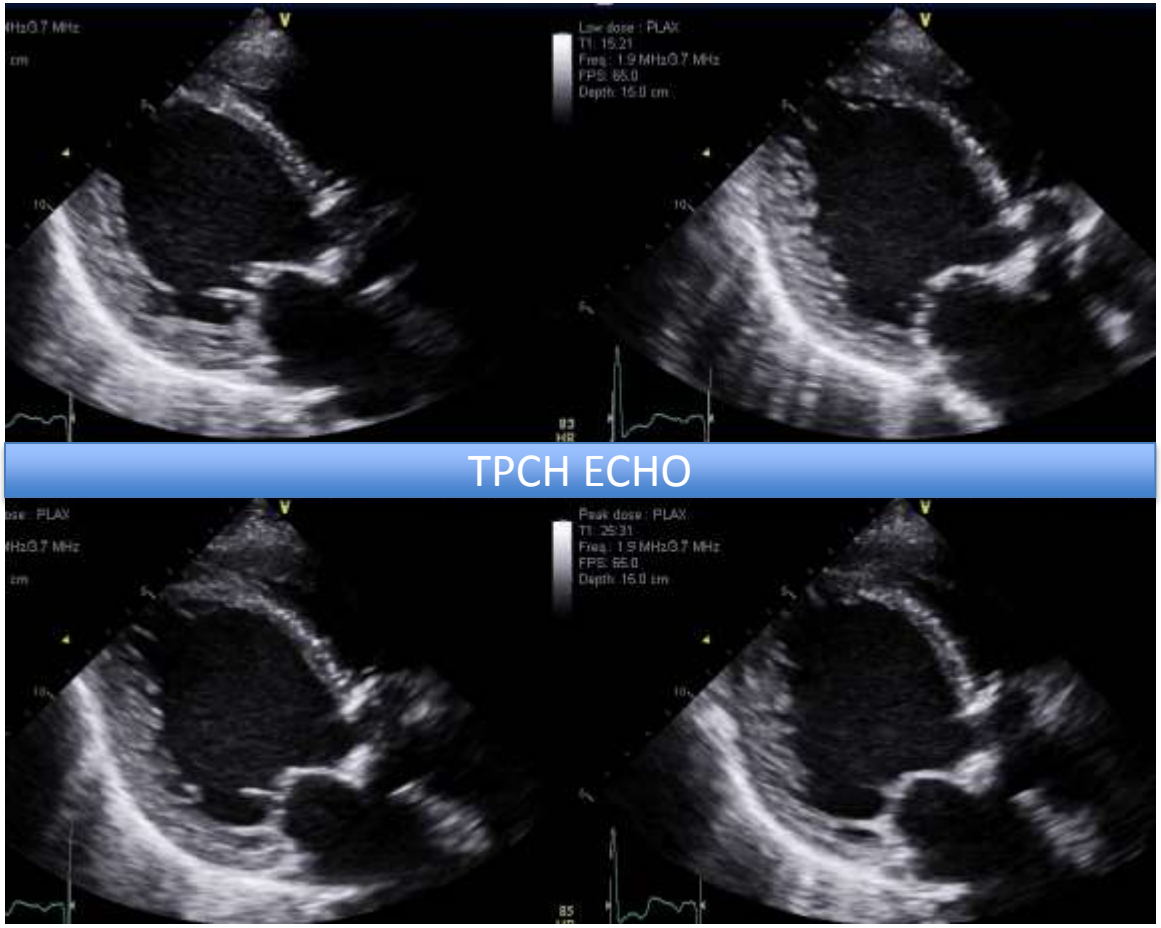
EF 20 %, GLS -7%

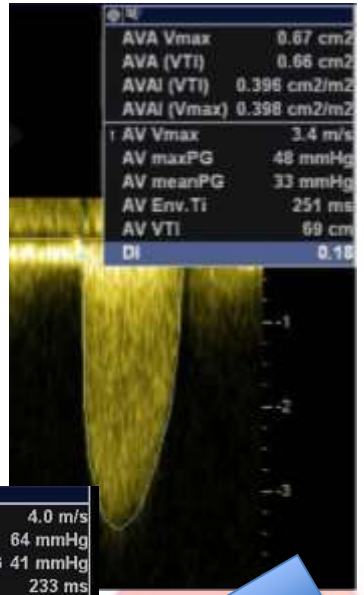
Aortic Valve: Low flow low gradient severe AS

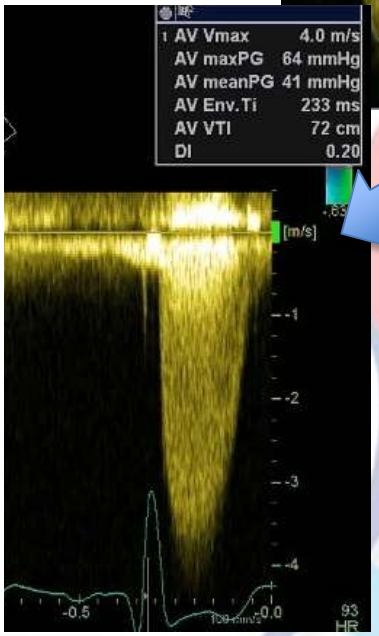
AVA 0.64 cm^2 . MG = 33mmHg. AR grade 1-2/4.

MR 2-3/4

Dobutamine Echo 8/10/15







DSE 8/10/15

Low Dose Dobutamine stress echo:

- **Severe LV systolic dysfunction**
- **Lack of LV contractile reserve.**

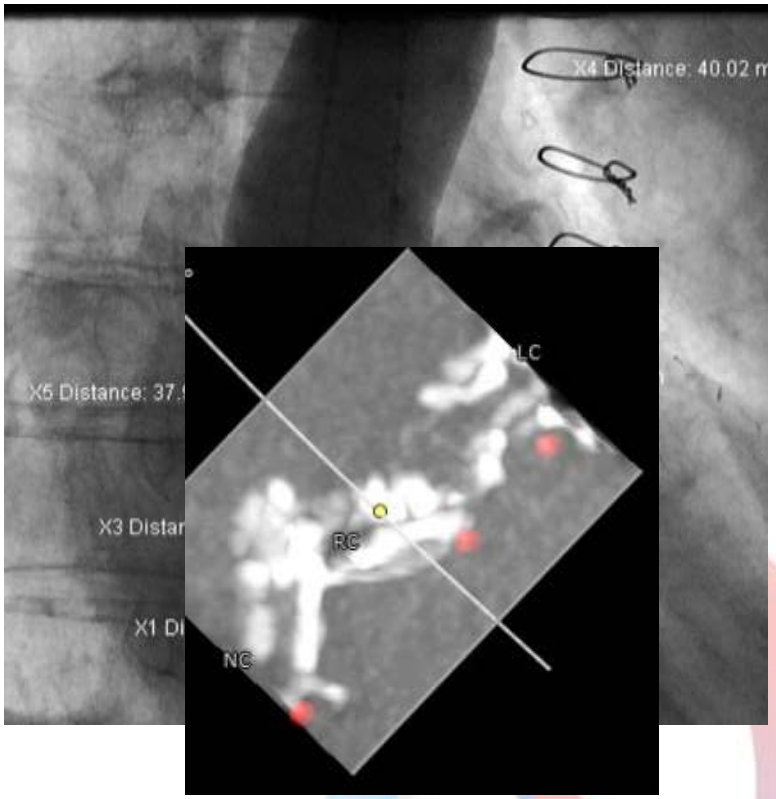
EF 21%, GLS -7%

Aortic valve:

- **Low flow low gradient severe AS**
- **AVA 0.72 cm², MG = 41mmHg.**

AR grade 1-2/4.

Severe anatomic calcification



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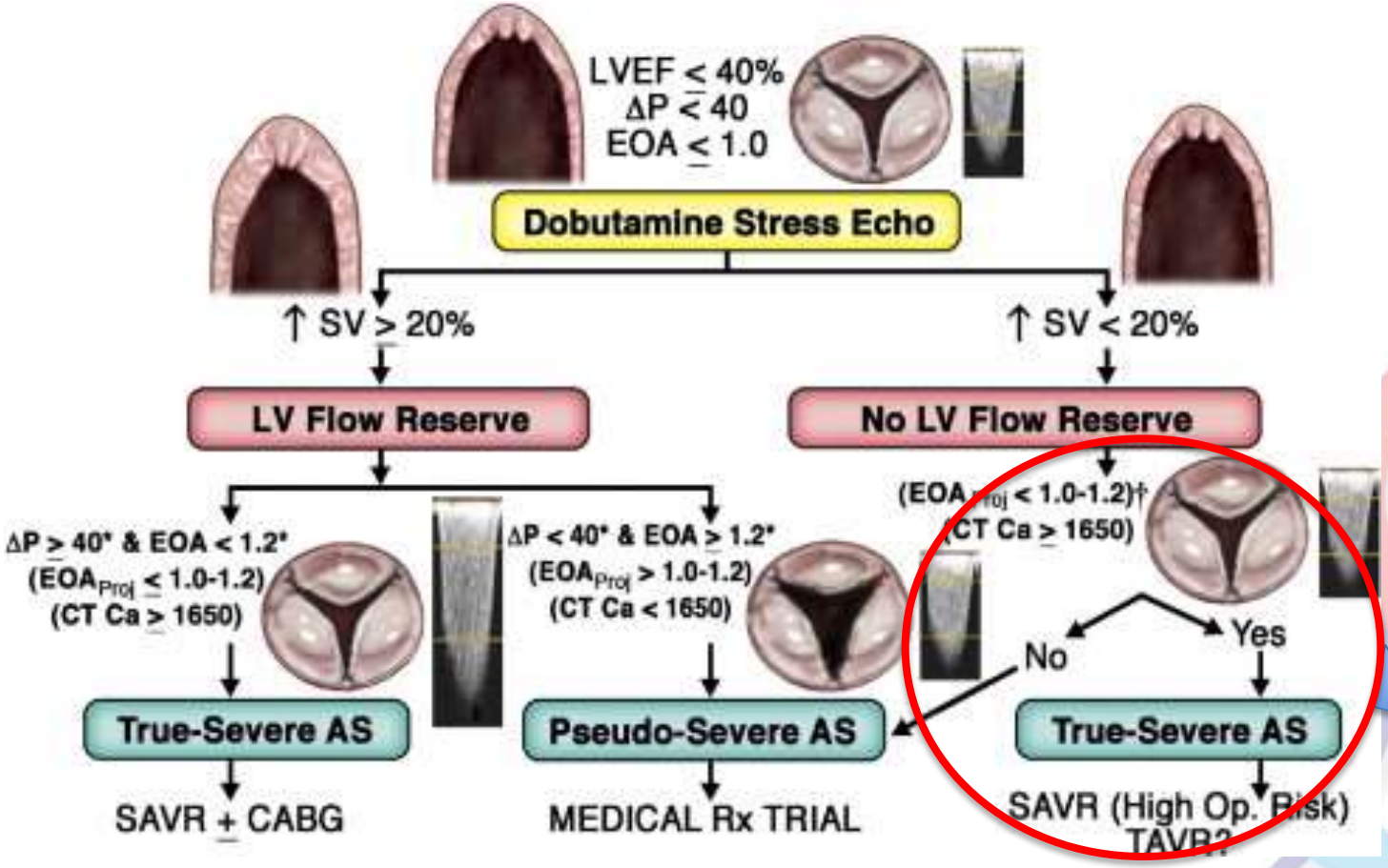
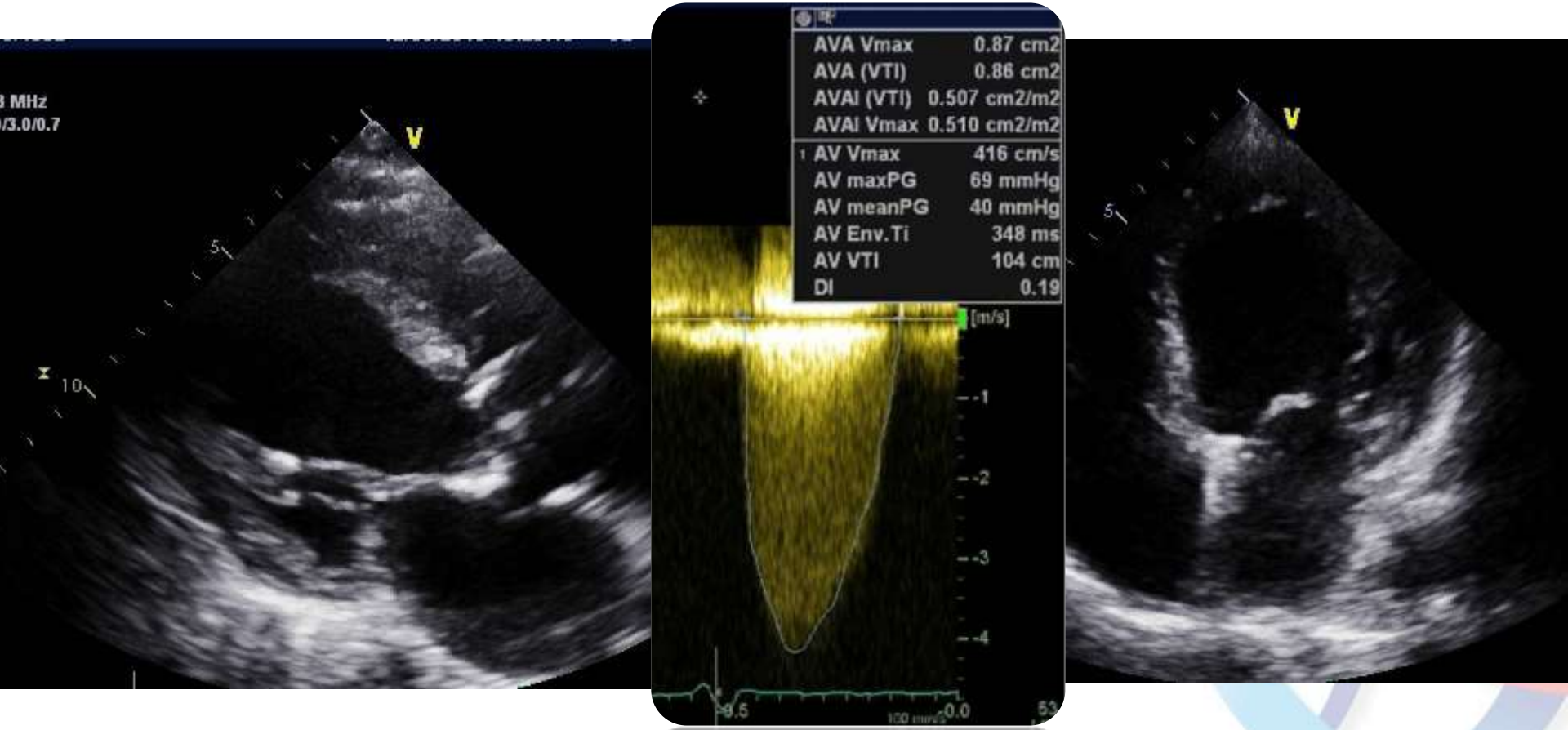


Echo Evaluation 12/08/16



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- Does LV function impart a worse prognosis with TAVI compared to Normal LVEF?

Transcatheter aortic valve implantation in patients with LV dysfunction

Elhmidi Y[1], Bleiziffer S, Deutsch MA, Krane M, Mazzitelli D, Lange R, Piazza N.

- 505 consecutive patients with severe aortic stenosis who underwent TAVI
- Patients were stratified according to LV function as follows: normal LV function (ejection fraction [EF] >50%), moderate LV dysfunction (EF 35%-50%) and severe LV dysfunction (EF ≤35%).
- No significant difference in 30-day mortality was observed between the LV function subgroups.

J Invasive Cardiol. 2014
Mar;26(3):132-8.

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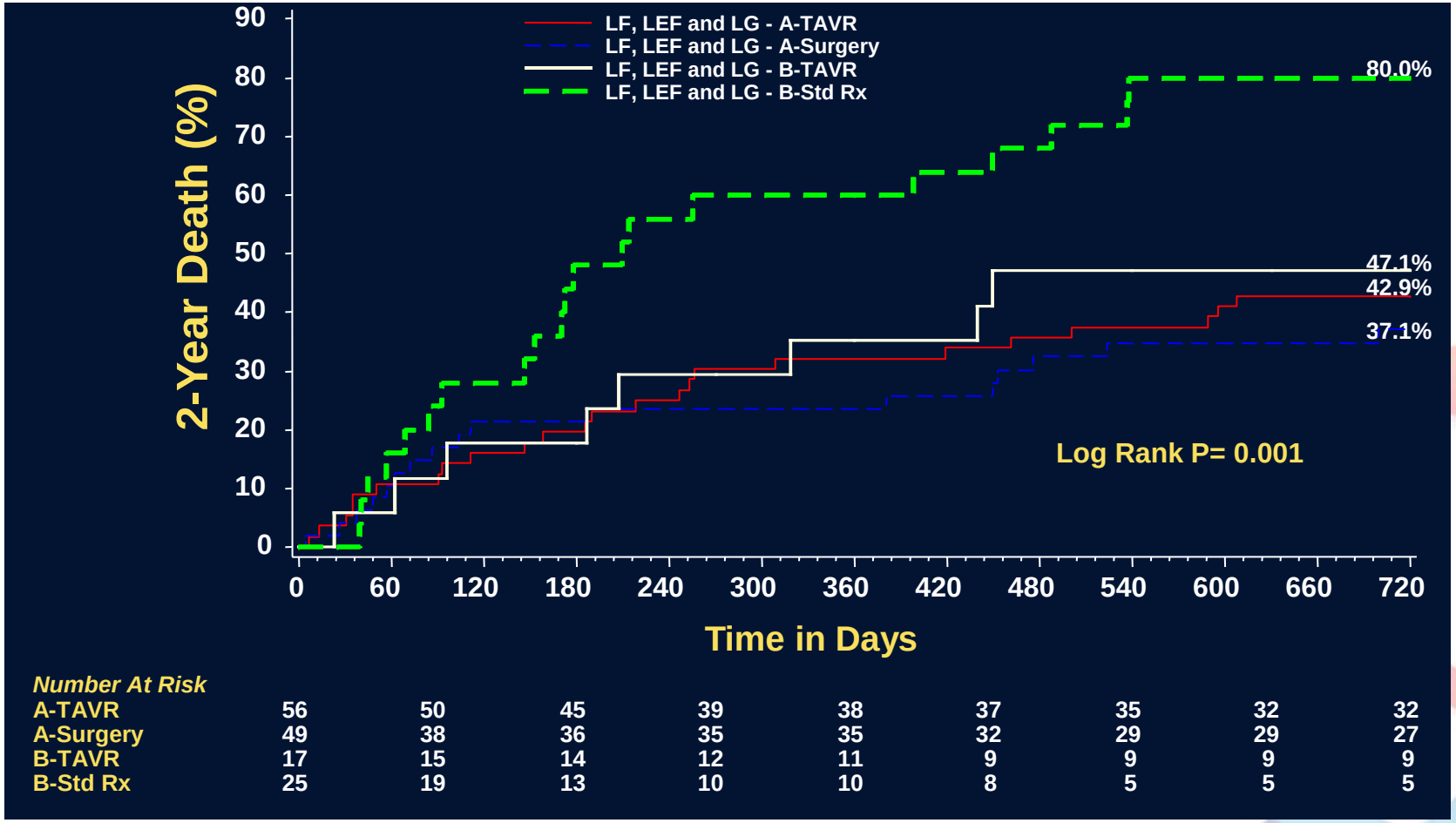
Treatment Comparison in Low-EF, Low-Flow, Low-Gradient



Herrmann et al Circulation 2013

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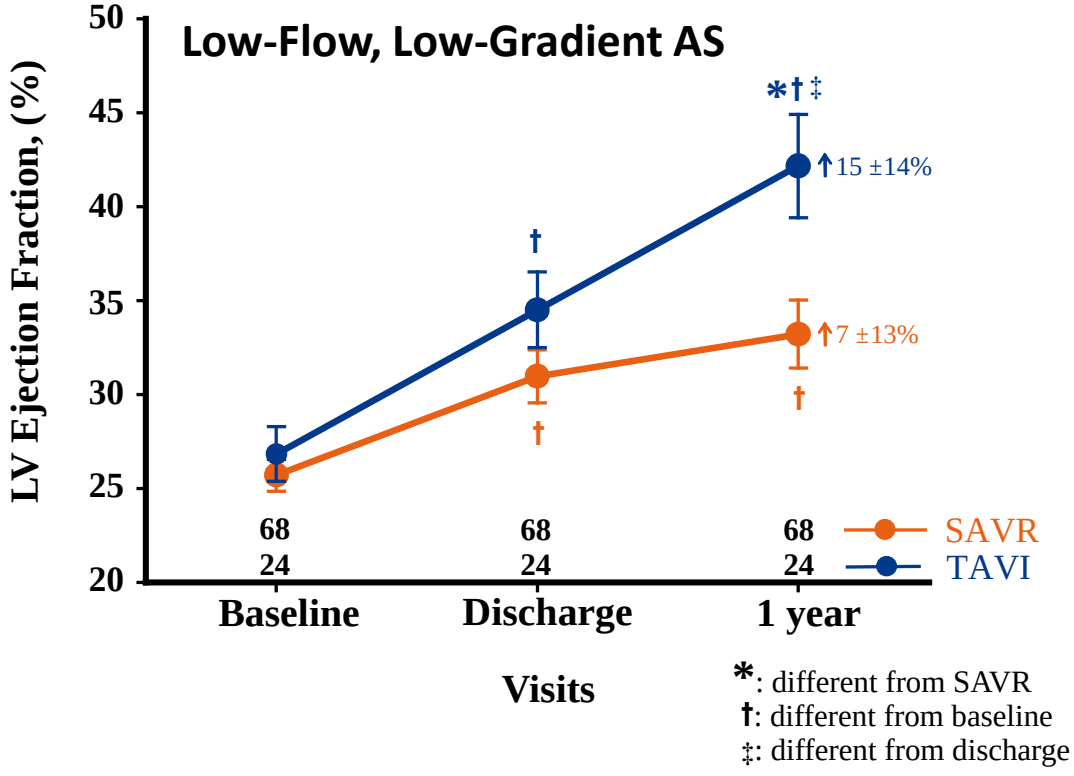
Recovery of LVEF in Patients with Low-LVEF, Low-Flow, Low-Gradient AS: TAVR versus SAVR



Clavel Circulation, 122:1928-36., 2010

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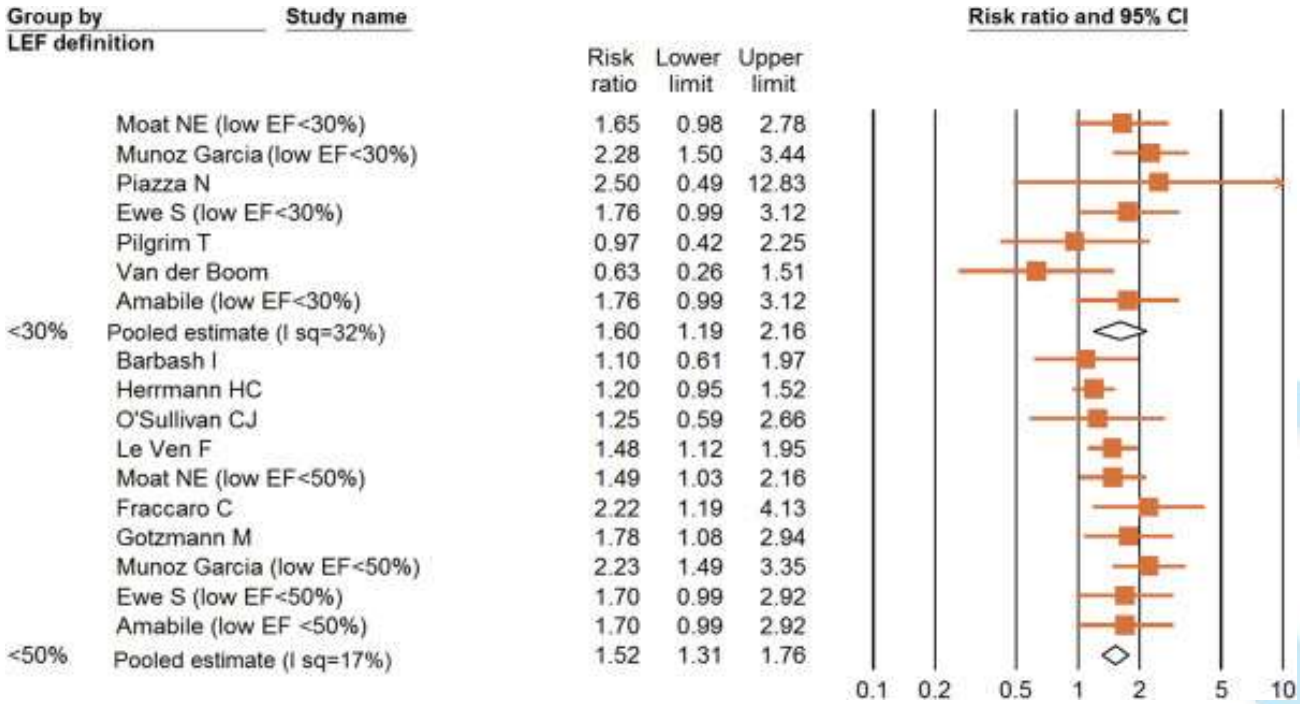
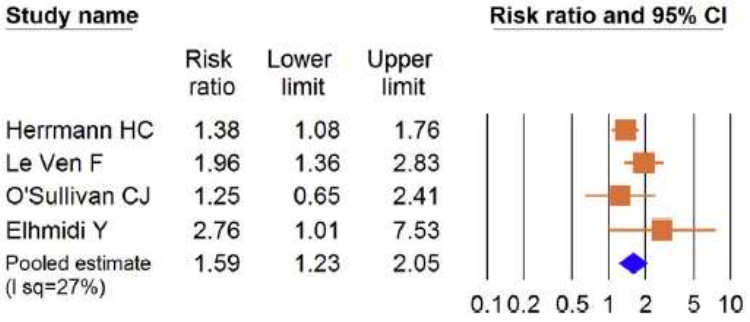
LV dysfunction & TAVI

- LV dysfunction increases risk mortality at 1 year



- Low gradient

Low SVI



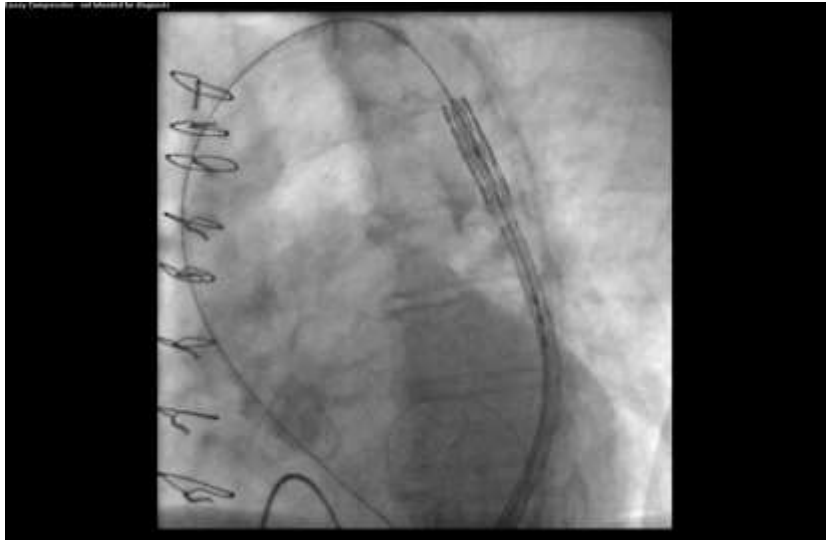
Summary and Discussion

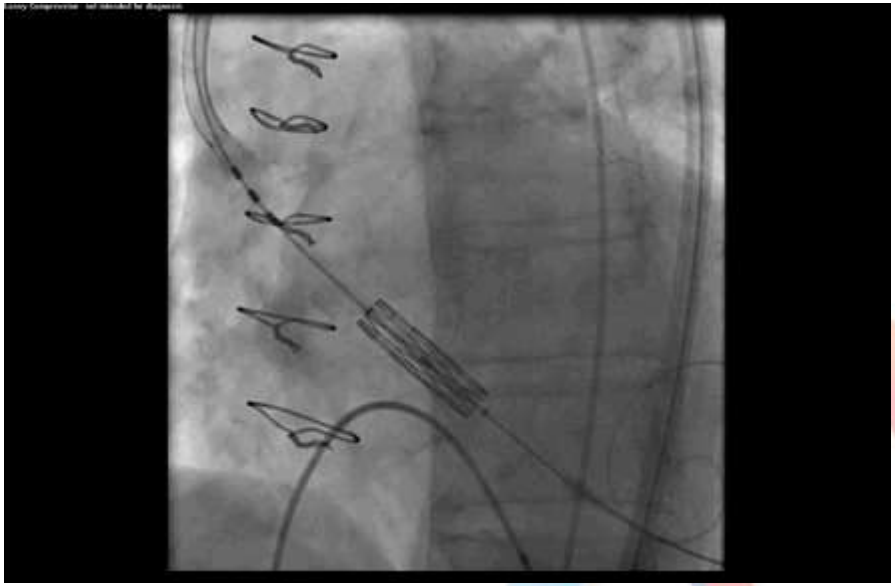
83yo male

- Mixed CMP- EF 30%
- Low flow, low gradient AS

- Technically suitable for: Femoral TAVI.
- Valve choice/sizing: Edward Sapien S3 29mm

Procedure



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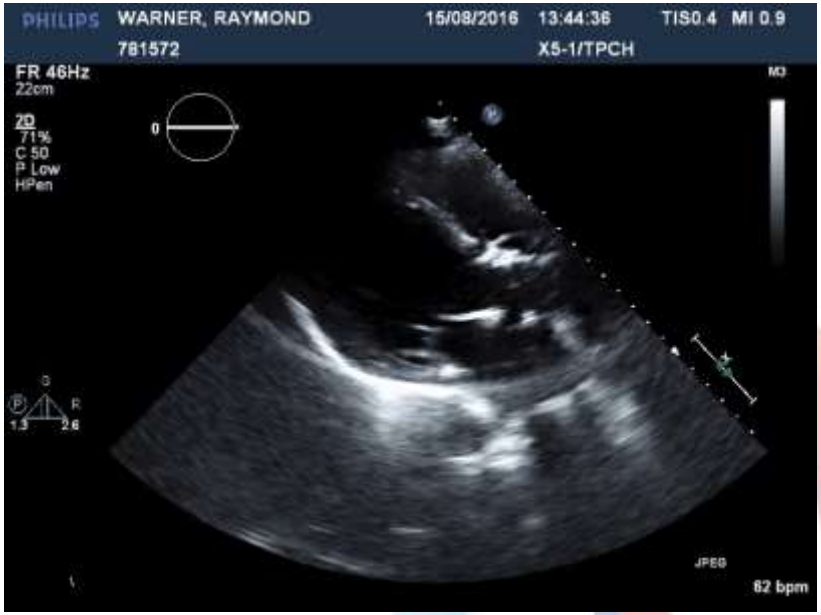
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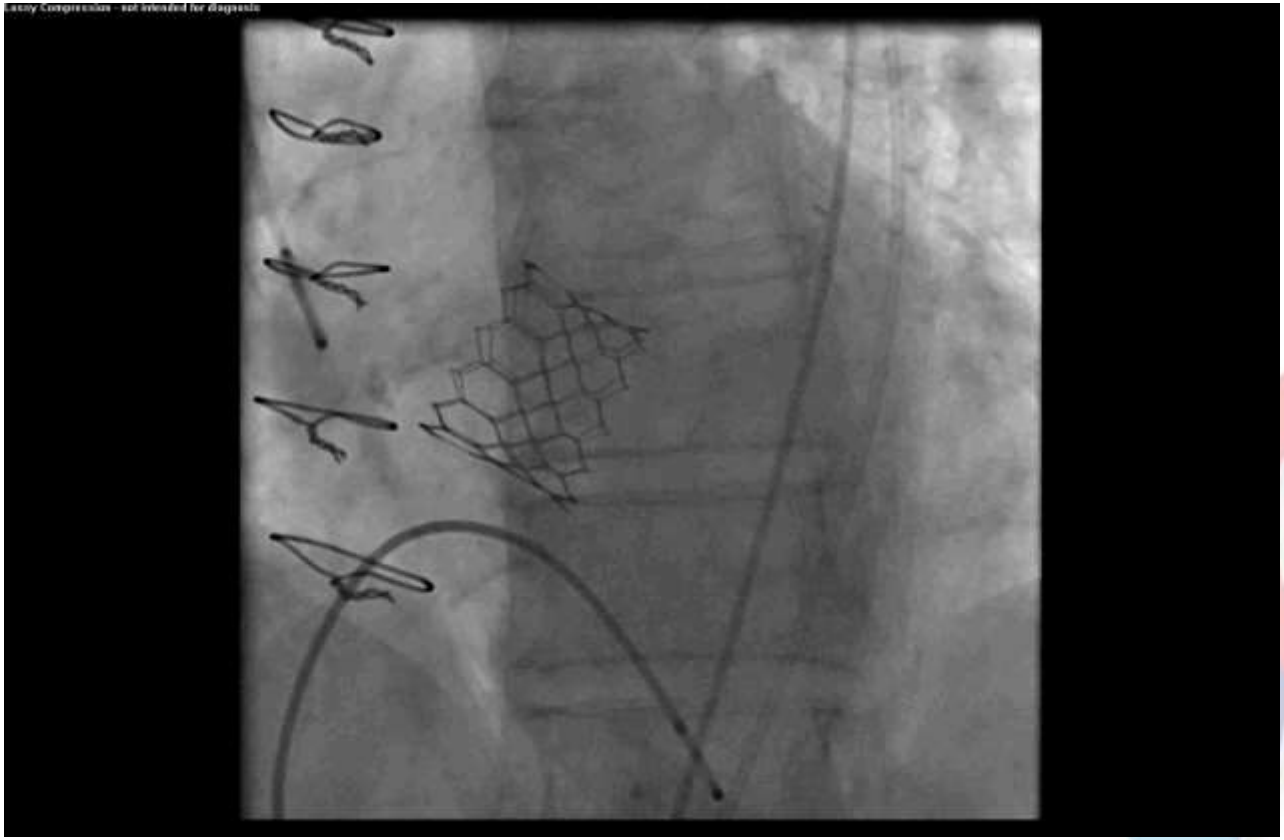

Conclusions LV Dysfunction:

- Important to establish the diagnosis of Aortic stenosis
- TAVI can be safely performed in pt severe Aortic stenosis and with lV dysfunction
- Outcomes are are improved with TAVI compared to medical therapy and survival is acceptable
- LV recovery may occur
- Patietn with Lv dysfunction have a worse prognosis post TAVI than those with normal EF