Paravalvular Leak:
Severity Assessment and Treatment

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Potential conflicts of interest

Speaker's name: Jean-claude Laborde

I have the following potential conflicts of interest to report:

- Research contracts
- Consulting — Medtronic
- Employment in industry
- Stockholder of a healthcare company
- Owner of a healthcare company
- Other(s)

I do not have any potential conflict of interest

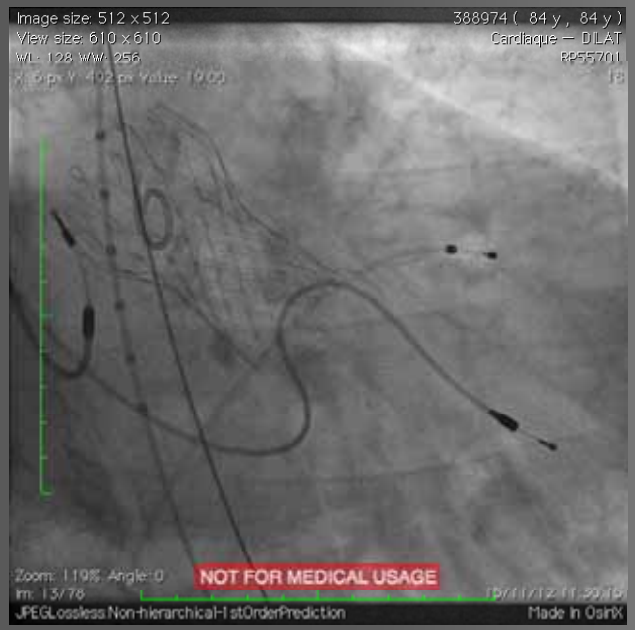
Paravalvular Leak: Severity Assessment and Treatment

Background

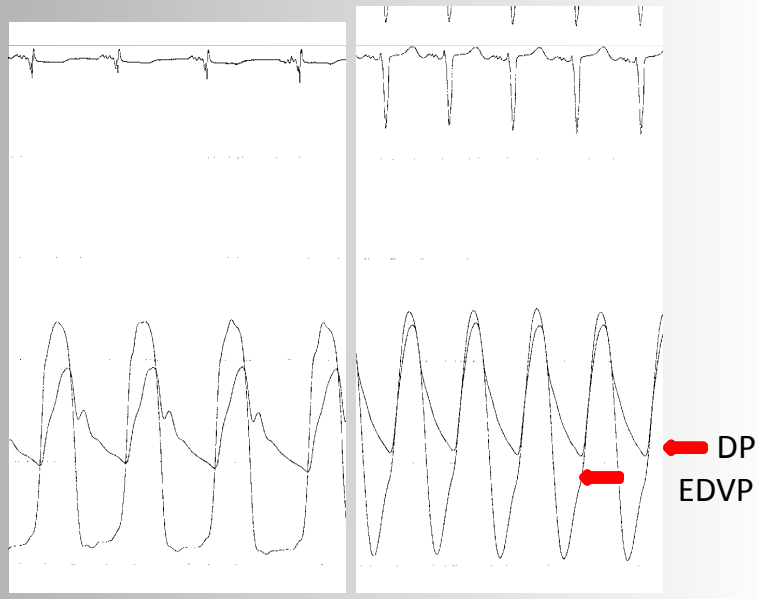
Paravalvular aortic regurgitation (PAR) negatively impacts the prognosis following transcatheter aortic valve replacement (TAVR) with dramatically increased morbidity and mortality in patients suffering from more-than-mild PAR

Paravalvular Leak

predictors of early and late mortality after TAVI



BEFORE AFTER



Angiogram T.E.E. Hemodynamics

Paravalvular Leak

Valve position and PVL assessment

- Frame Alignment
- RAo projection

- Location of Pigtail Catheter
- Amount of Contrast Medium
- Heart rate
- Pressure Level
- Projection : RAO vs LAO
- Location of Paravalvular Leak
- LV Hypertrophy / LV impaired function
- Etc……

How to manage significant residual aortic regurgitation

When to apply correctives mesures ?

At the time of Valve Implantation procedure

Minimize PAR

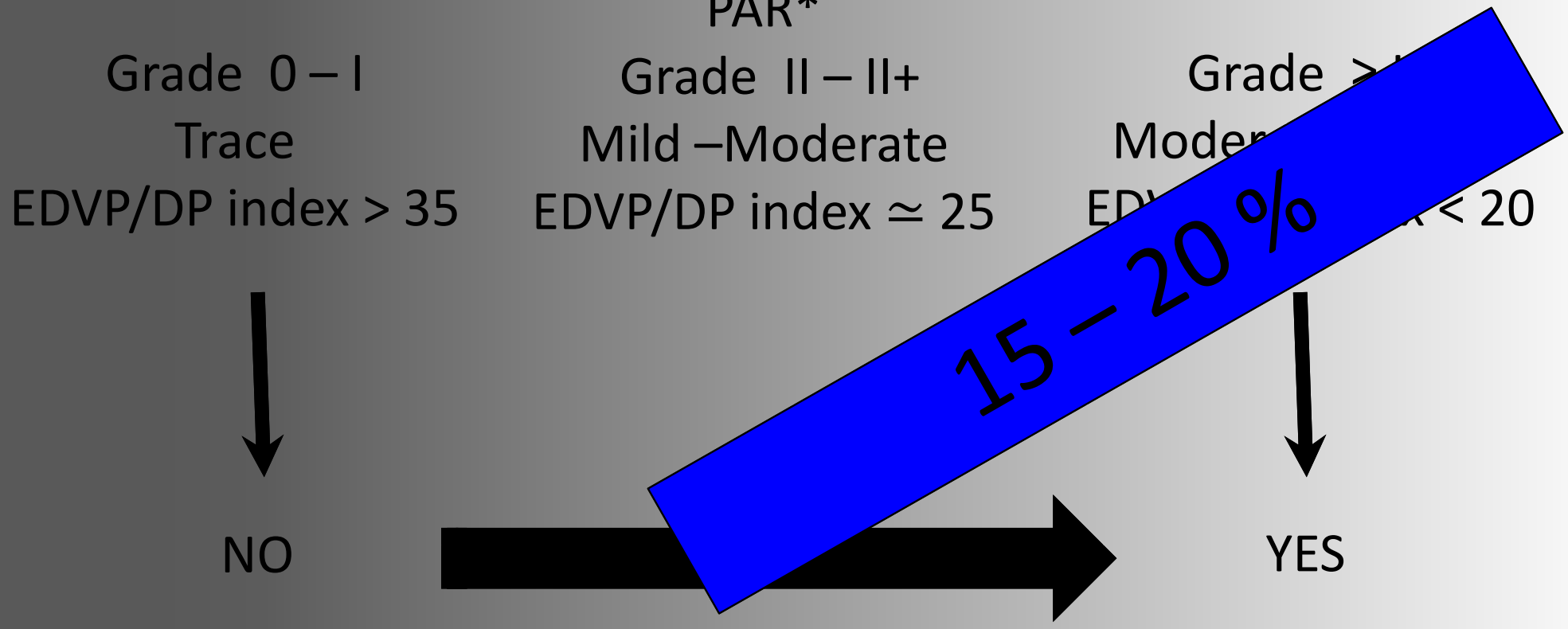
At Follow-up

Symptomatique PAR

Increased (or under-evaluated) PAR

How to manage significant residual aortic regurgitation

When to apply correctives mesures ?



* hemodynamic measurements and imaging modalities

How to manage significant residual aortic regurgitation

Identify patients at risk ?

Previous patient anatomy

NO

YES

How to manage significant residual aortic regurgitation

Identify patients at risk ?

Previous patient hemodynamic status

AS + AR Grade > III

NO

Low flow- Low gradient

- LV Diastolic dysfunction
- Poor EF
- Severe LV Hypertrophy

YES

How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?

- ✓ **stent frame underexpansion**

  due to heavily calcified cusps

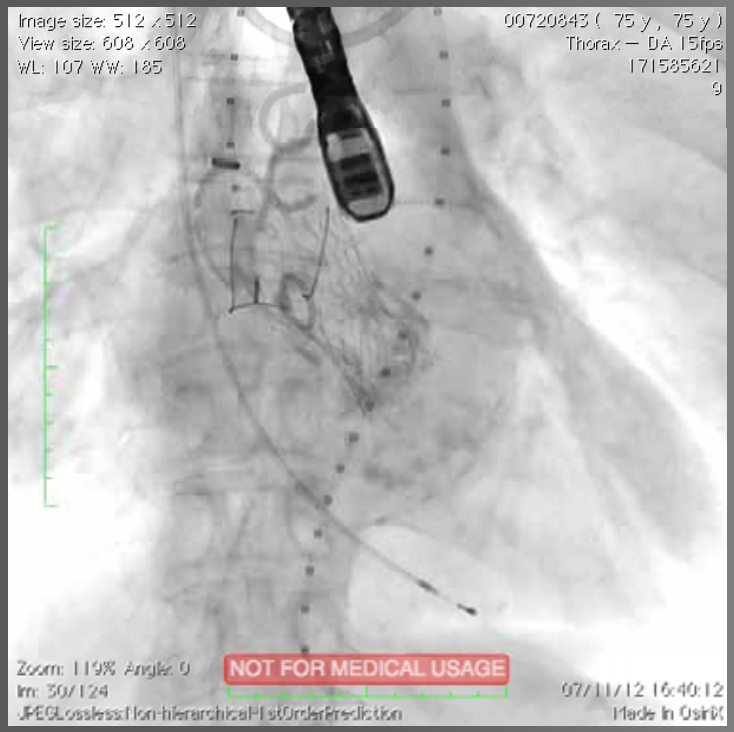
- ✓ **suboptimal placement of the prosthesis**

- ✓ **annulus-prosthesis-size mismatch**

  due to malsizing

How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?



- ✓ **stent frame underexpansion**

  nominal << effective frame diameter

- ✓ suboptimal placement of the prosthesis

  Skirt position vs sealing zone

- ✓ **annulus-prosthesis-size mismatch**

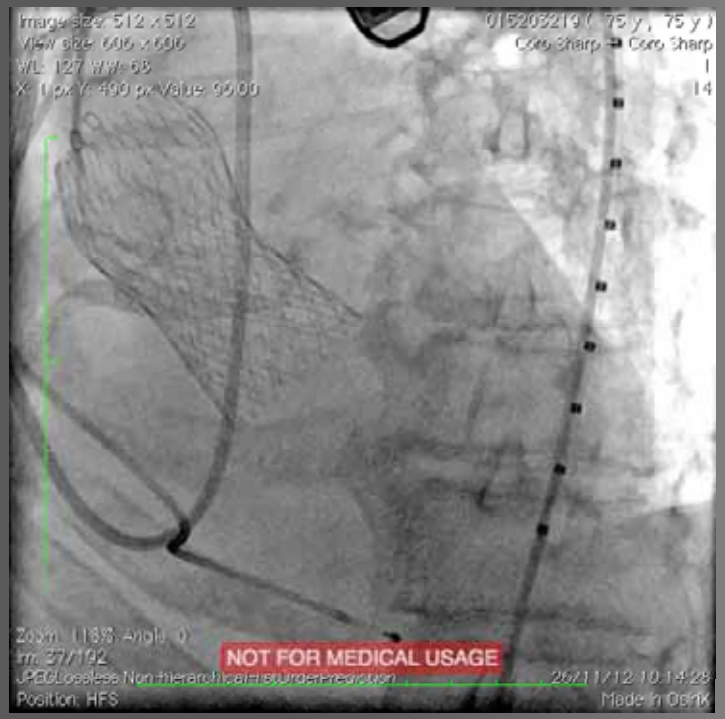
  Nominal = effective valve diameter

  Native leaflets vs frame alignment

(23mm CoreValve / 21 mm annulus)

How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?



- ✓ stent frame underexpansion

  nominal << effective frame diameter

- ✓ **suboptimal placement of the prosthesis**

  Skirt position vs sealing zone

- ✓ annulus-prosthesis-size mismatch

  Nominal = effective valve diameter

  Native leaflets vs frame alignment

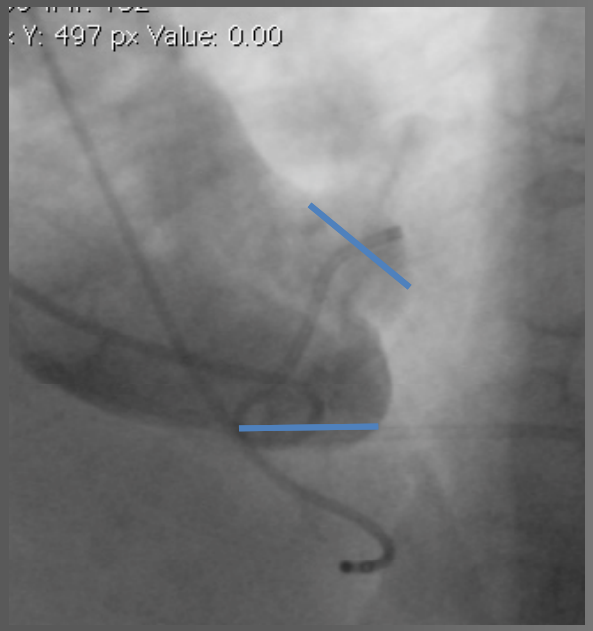
(29mm CoreValve / 24 mm annulus)

How to manage significant residual aortic regurgitation

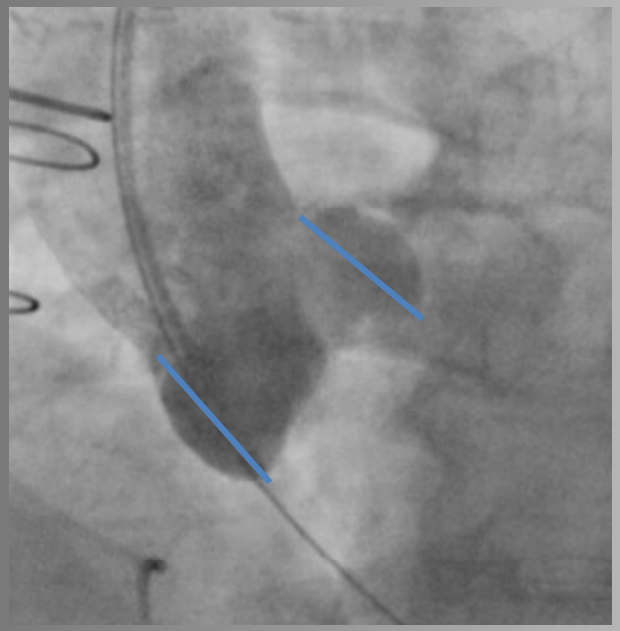
Identification of the mechanism of PAR ?

suboptimal placement of the prosthesis

Skirt position vs Sealing zone



(ST 35/ annulus 26)



(ST 24/ annulus 26)

CoreValve 29 mm
Position 4 mm

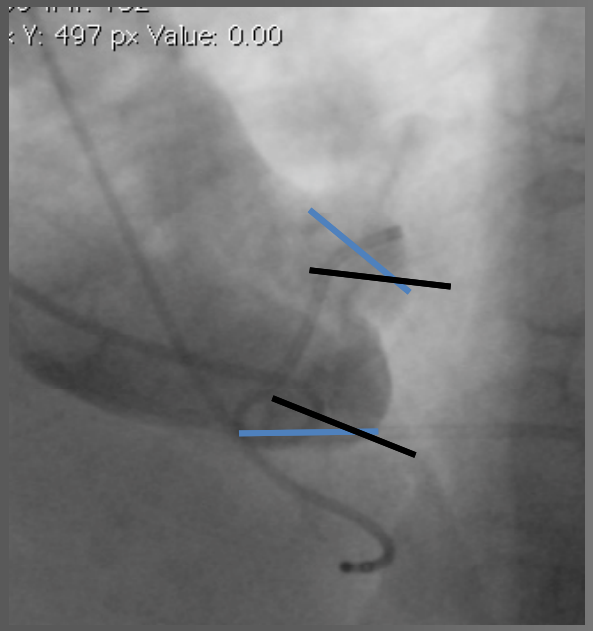
Valve Commissures pathways

How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?

suboptimal placement of the prosthesis

Skirt position vs sealing zone



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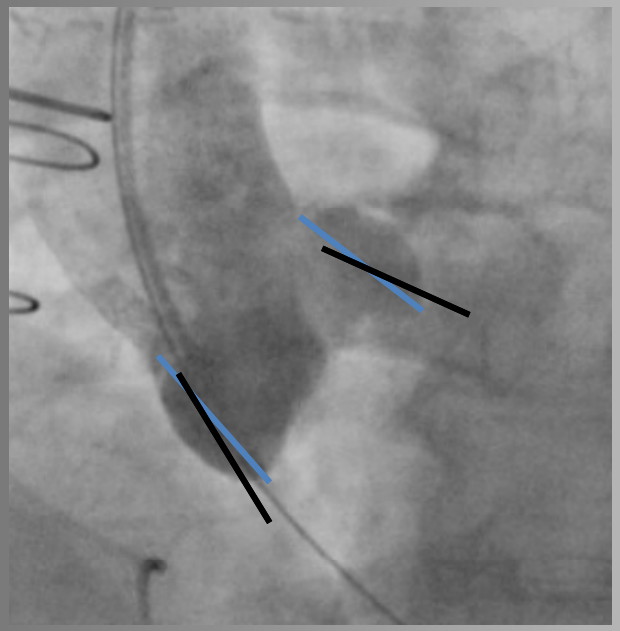


(ST 24/ annulus 26)

CoreValve 29 mm
Position 4 mm

— Corevalve skirt

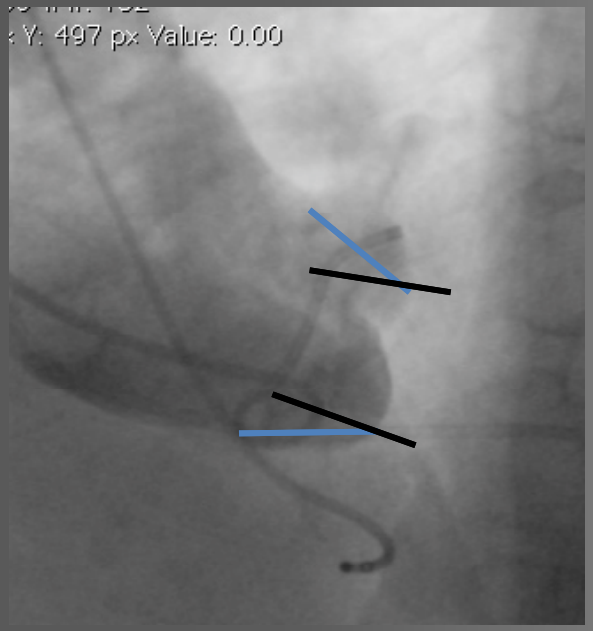
Outflow 29 mm
Inflow 24 mm

How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?

suboptimal placement of the prosthesis

Skirt position vs sealing zone



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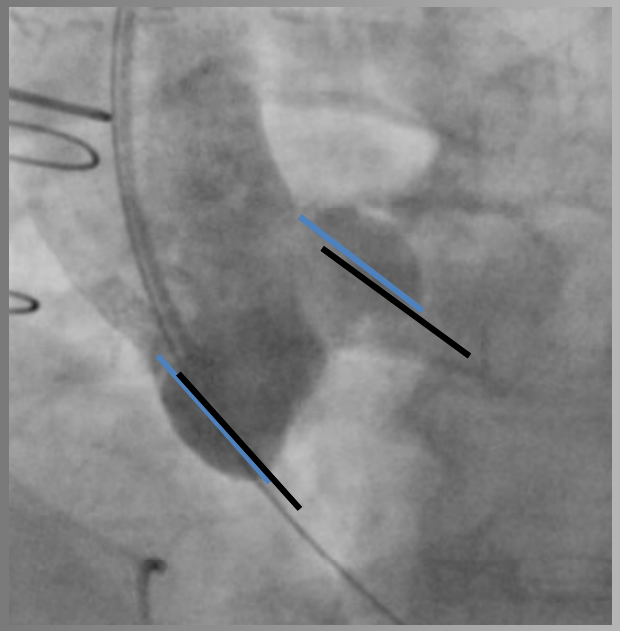

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CoreValve 29 mm
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How to manage significant residual aortic regurgitation

Identification of the mechanism of PAR ?

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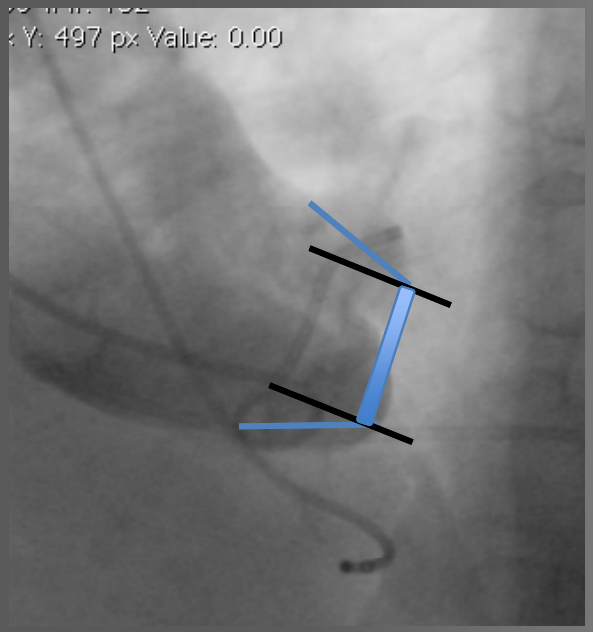
Skirt position vs sealing zone



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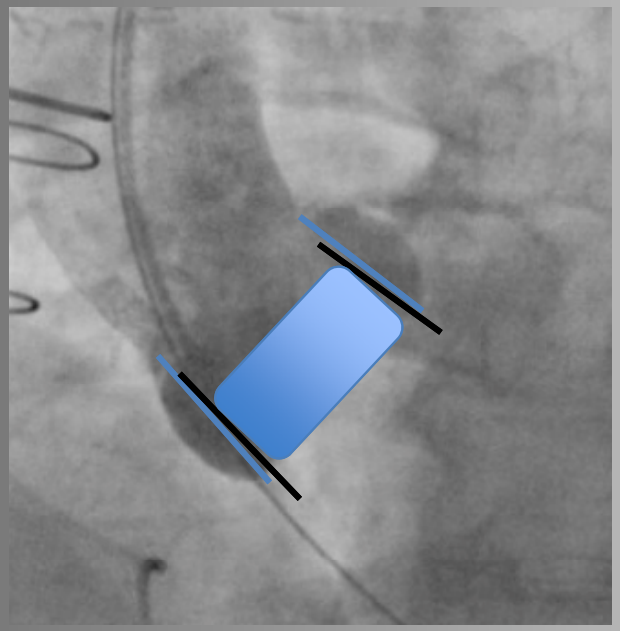


(ST 24/ annulus 26)

CoreValve 29 mm
Position 4 mm

Effective
sealing zone

How to manage significant residual aortic regurgitation

Correctives mesures ?

- ✓ **Balloon Aortique Valvuloplasty (BAV)**
- ✓ **Valve-in-Valve (ViV)**
- ✓ 2rd valve
- ✓ Valve Repositioning
- ✓ transcatheter device closure procedures
- ✓ Surgery

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **stent frame underexpansion**

Balloon Aortic Valvuloplasty (BAV)

Balloon Size :

1st choice : Annulus measurement

Valve anatomy (Heavily vs mild Ca+)

Route anatomy (coronary ostias)

Valve position (High vs Low)

Max. : 22mm for 23mm CoreValve

25mm for 26mm CoreValve

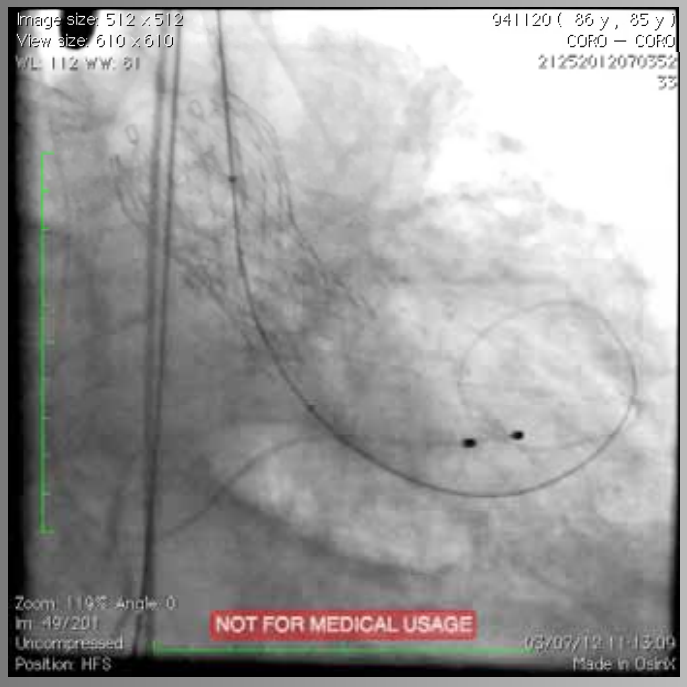
28mm for 29 & 31mm CoreValve

Rapid-Pacing

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **stent frame underexpansion** (31mm Corevalve)

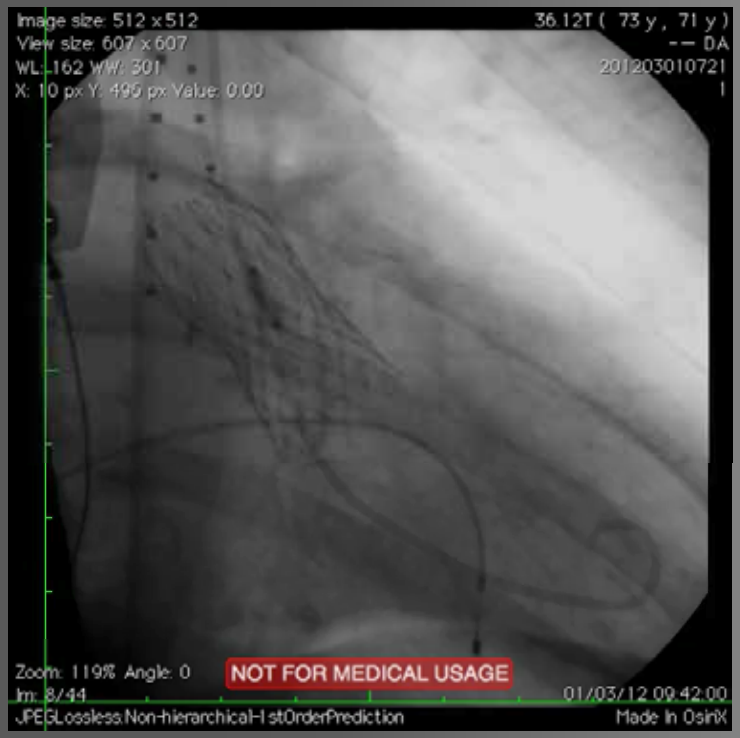


(annulus : Mild Ca+ / 27.5 mm Balloon size : 28 mm in diameter)

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **suboptimal placement of the prosthesis**



Valve-in-Valve (ViV)

Valve Size :

1st choice : Same valve size

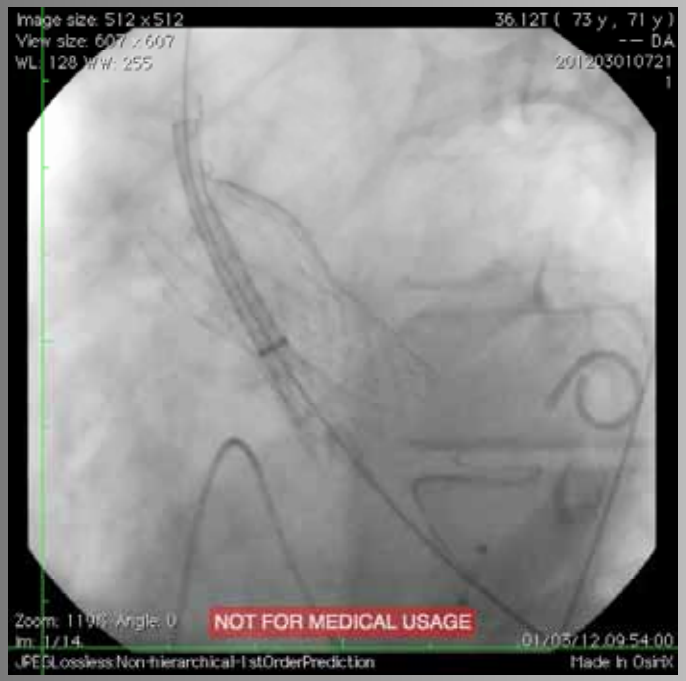
Valve anatomy (Coronary ostias, Mitral)

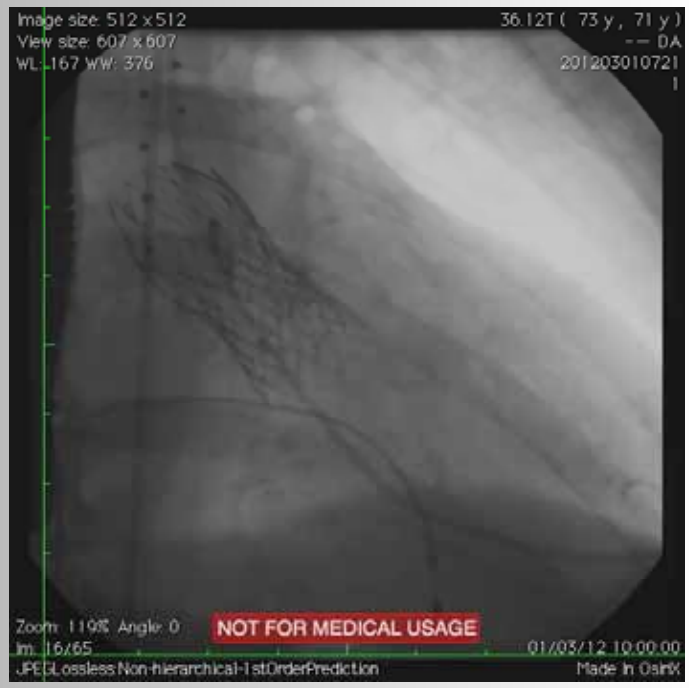
Position for the 2rd valve : original target

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **suboptimal placement of the prosthesis**





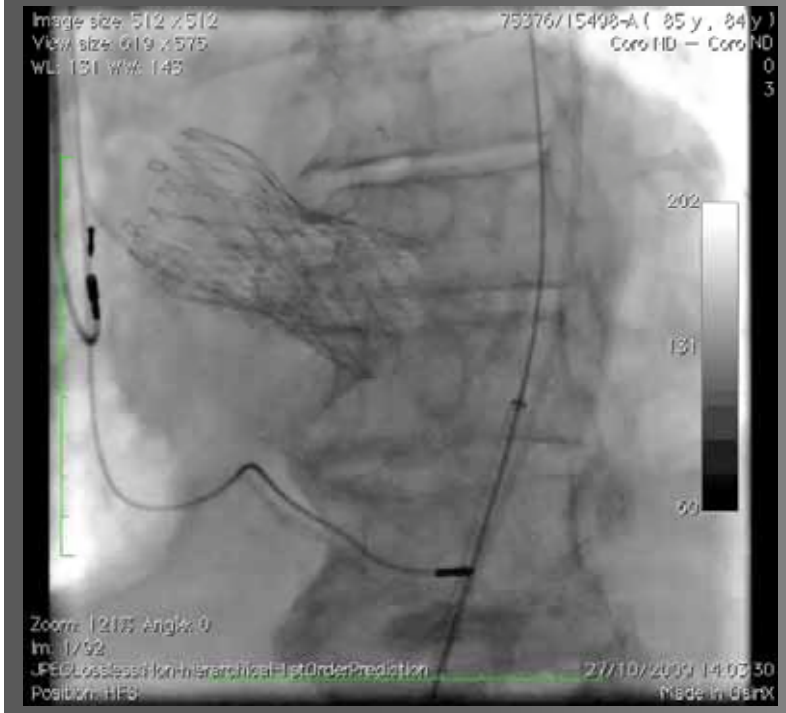
(annulus : Mild Ca+ / 27.5 mm Balloon size : 28 mm in diameter)

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **suboptimal placement of the prosthesis**

Valve repositioning (Goose-neck catheter)

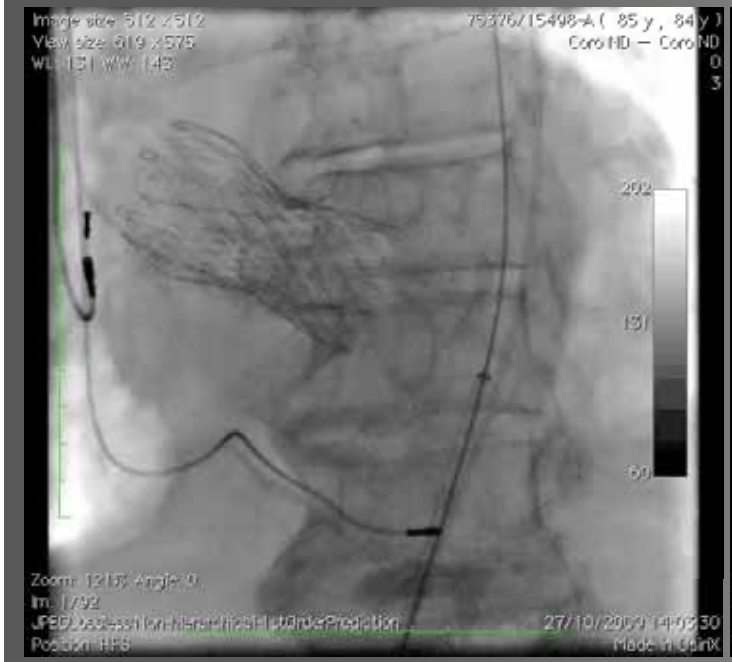


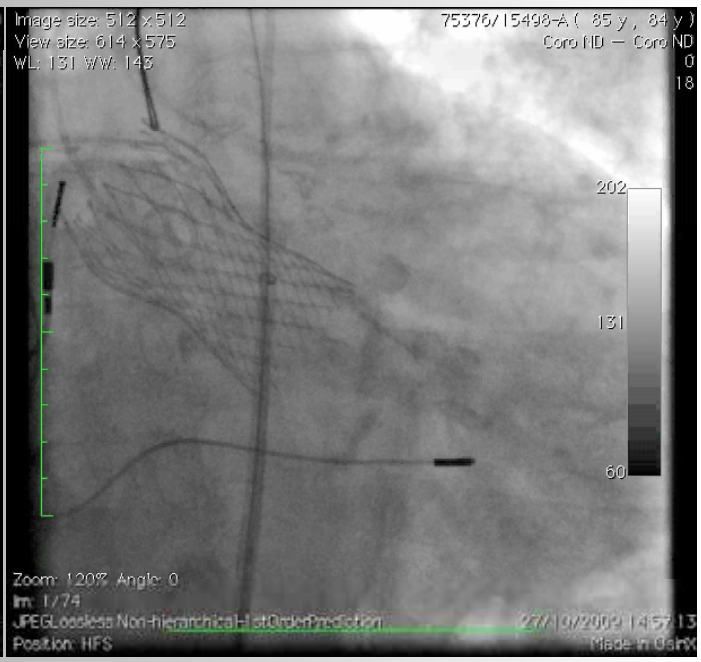
Valve anatomy (Ca+, Coronary ostias)
Route anatomy
Ascending aorta, Mitral impairment
Reposition for the 2rd valve :
Dictate by hemodynamic measurements

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **suboptimal placement of the prosthesis**





How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **annulus-prosthesis-size mismatch**

2rd valve

Valve Size :

Higher valve size

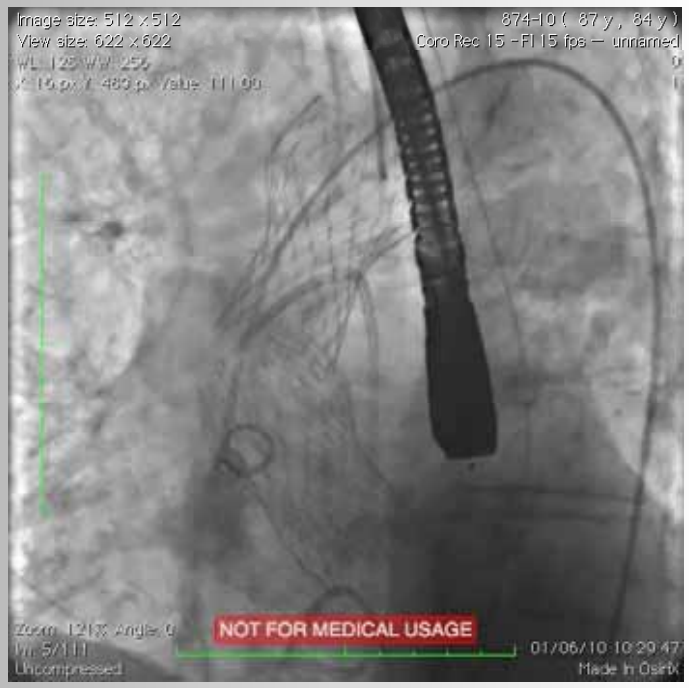
Valve anatomy (Ascending aorta)

Position for the 2rd valve : original target

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **annulus-prosthesis-size mismatch (**1st valve: 26 mm Corevalve)

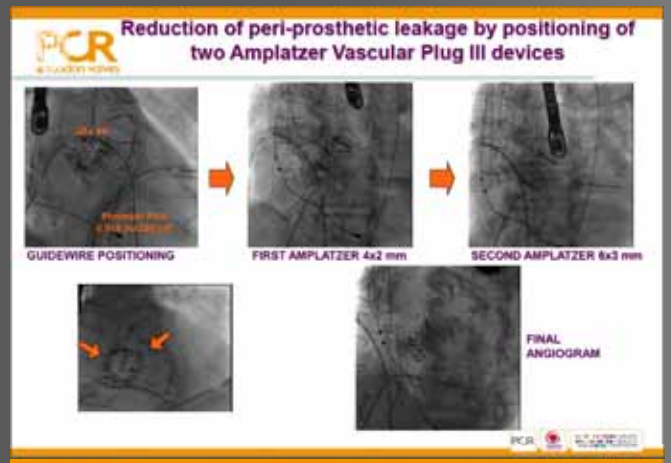


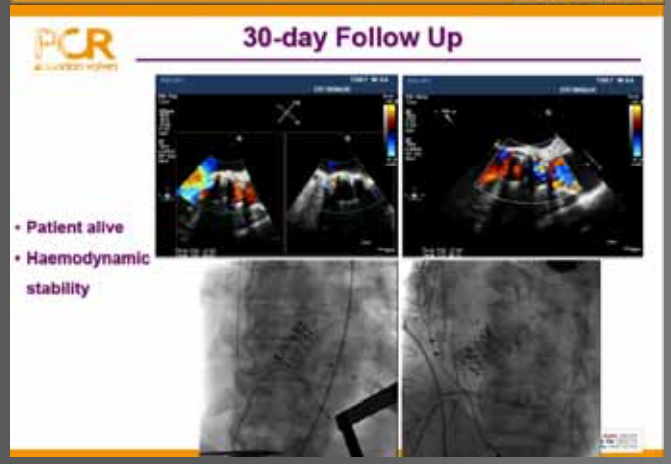
(annulus : Mild Ca+ / ~~23~~ 24.5 mm 2rd valve: 29 mm Corevalve)

How to manage significant residual aortic regurgitation

Correctives mesures of PAR ?

- ✓ **annulus-prosthesis-size mismatch**





transcatheter device closure procedures

Device:

Amplatzer

True PAR vs ruptured sinus of valsalva

Valve vs Route anatomy position

(skirt , LVOT)

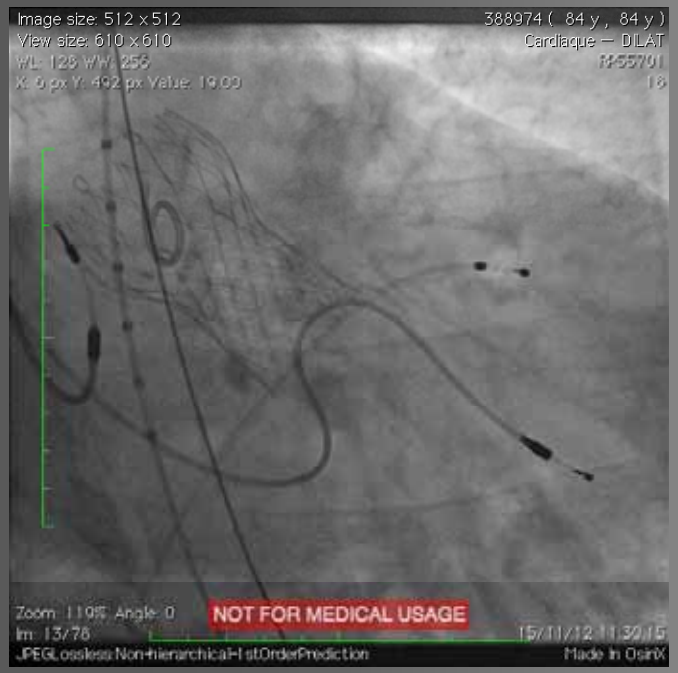
Summary

Selection of the proper strategy and potential corrective measure require :

- Accurate assessment of PAR and understanding of his mechanism
- Good assessment of the expected benefit and the potential risk for each optional corrective technique

THANK YOU

Paravalvular Leak



Transcatheter Aortic Valve Implantation With the Edwards SAPIEN Versus the Medtronic CoreValve Revalving System Devices: A Multicenter Collaborative Study: The PRAGMATIC Plus Initiative

793 patients were included: 453 (57.1%) treated with the MCV and 340 (42.9%) with the ESV.