# Balloon Valvuloplasty for Critical Aortic Stenosis

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# Balloon Valvuloplasty for Critical Aortic Stenosis

In conclusion:

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## *Editorial Comment*

**Aortic Valve Morphology is Associated with Outcomes Following Balloon Valvuloplasty for Congenital Aortic Stenosis:** Reflection on Morphological Retrospection Aids Selection for Interventional Rejection

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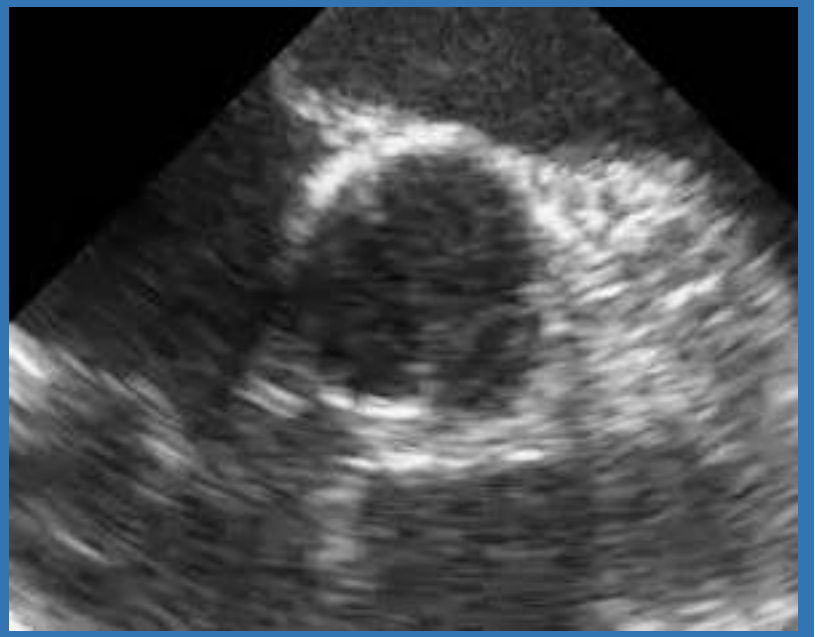
**Catheterization and Cardiovascular Interventions 81:96 (2013)**

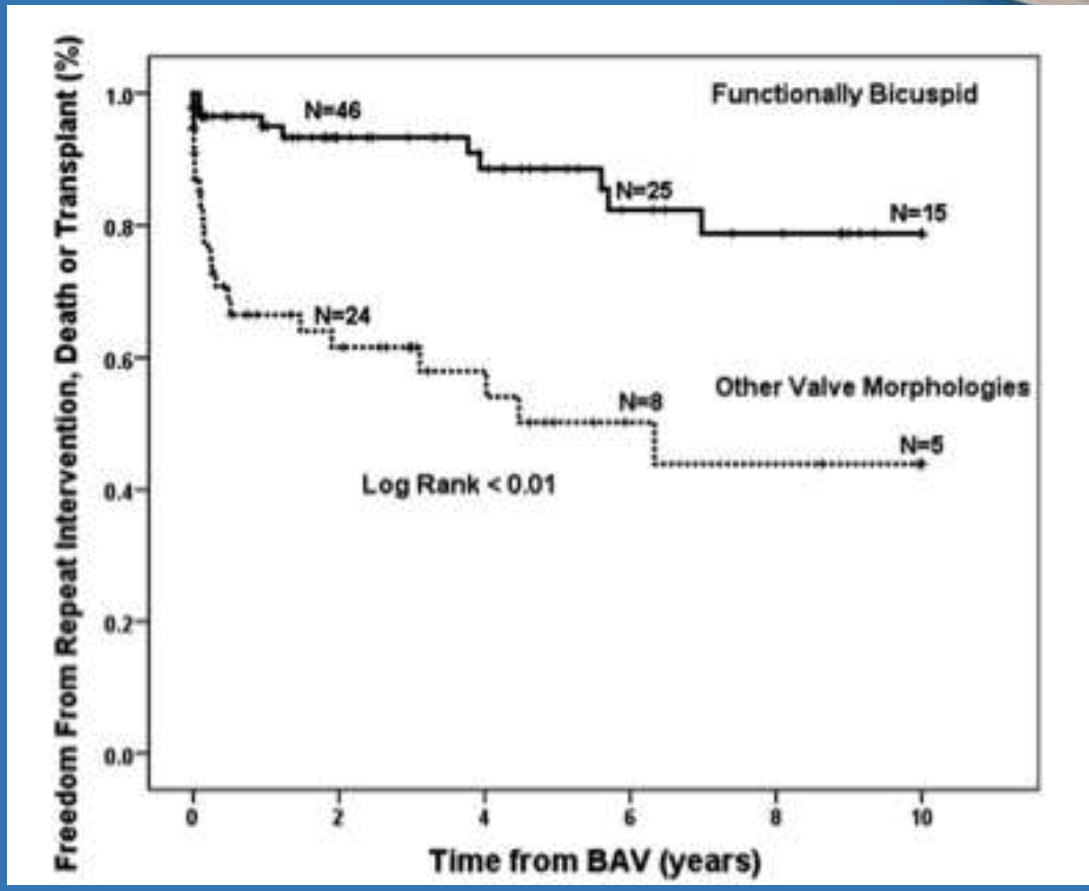
# Neonatal aortic stenosis

## Anatomy

- It is really about anatomy / pathology
- Good anatomy = good result
- Bad anatomy = poor result
- Bad anatomy, small contracted LV, mitral abnormalities, bicuspid valve (who says?) unicuspid valve (who says?), Endocardial fibroelastosis – how much – how do you measure it?
- But who should get what?

# Selection using valve morphology?





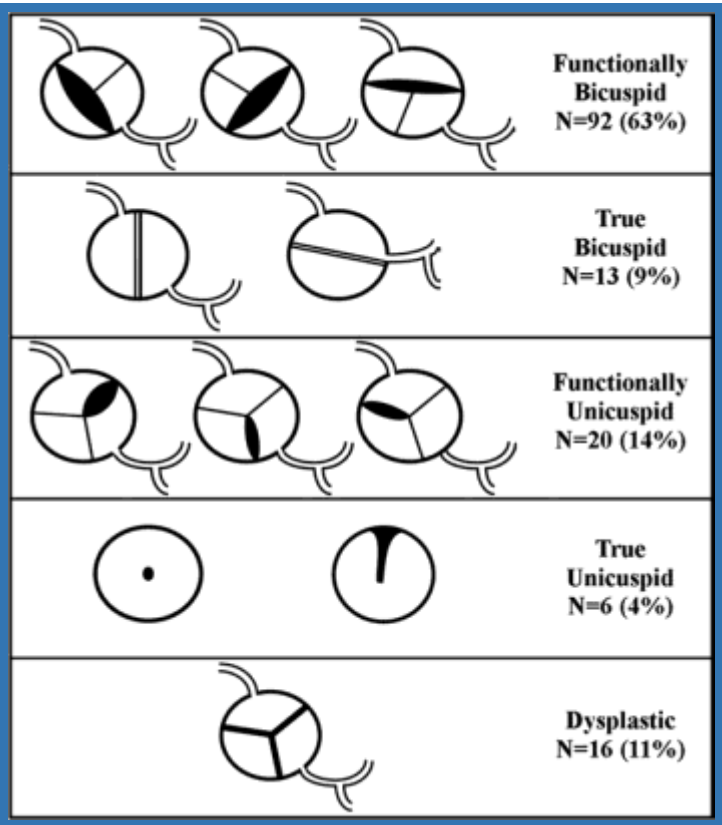

Maskatia et al CCVI 2013;81:90-95

# Selection using valve morphology?

Catheterization and Cardiovascular Interventions 81:90–95 (2013)

## Aortic Valve Morphology Is Associated With Outcomes Following Balloon Valvuloplasty for Congenital Aortic Stenosis

Shiraz A. Maskatia,* MD, Henri Justino, MD, Frank F. Ing, MD, Matthew A. Crystal, MD, Raphael J. Mattamal, BS, and Christopher J. Petit, MD



# Selection using valve morphology?

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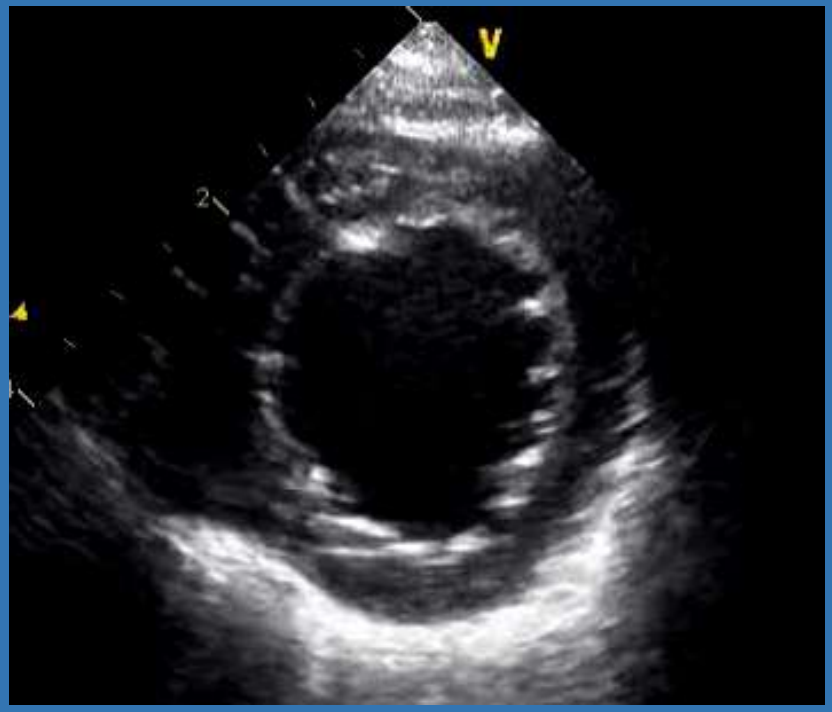
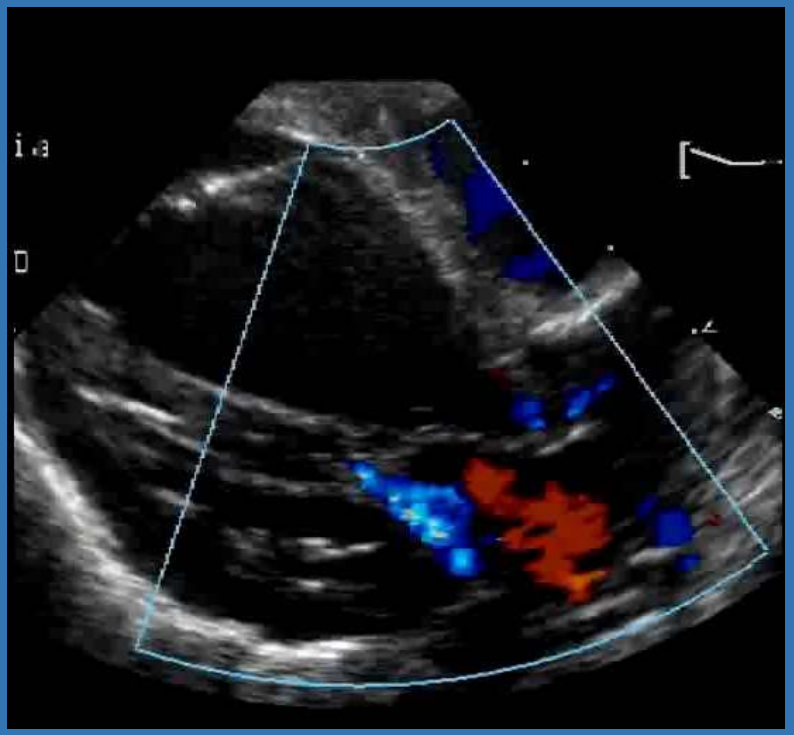
## Valve Morphology?

# Contracted / Dilated ventricle

It is not just about the valve morphology



# Other confounding factors

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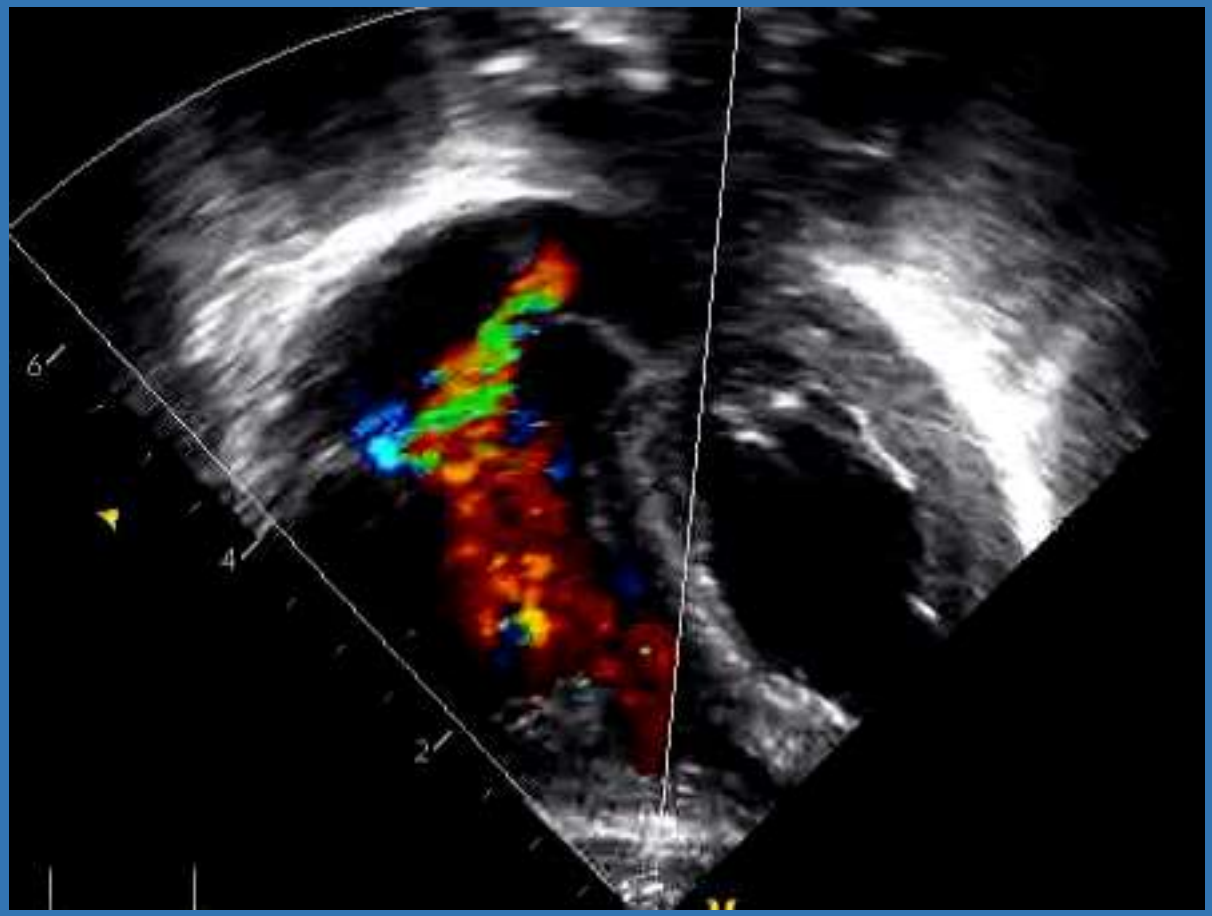
Atrial shunting
Role in reducing LVEDP, LV 'output'



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# The good the bad and the ugly

Difficulty assessing severity and result

Gradient limited : Poor LV function: Gradient post can be greater than pre

Assessing cardiac output with PDA difficult

LA & LV volume decompression with atrial shunting

# Access site

- Retrograde femoral arterial
- Carotid artery
- Axillary artery
- Anterograde femoral vein
  Umbilical
- Hybrid

# Balloon to annulus size

Optimal balloon to annulus ratio 0.9-1

606 patients across 23 institutions*

- Practical terms start small and increase gradually

  Echo and angiography dimensions may not agree

    "Eye ball" the balloon inflation to assess size appropriateness

  Try and keep balloons in 0.5mm increments (Mini Ghost 0.5mm)

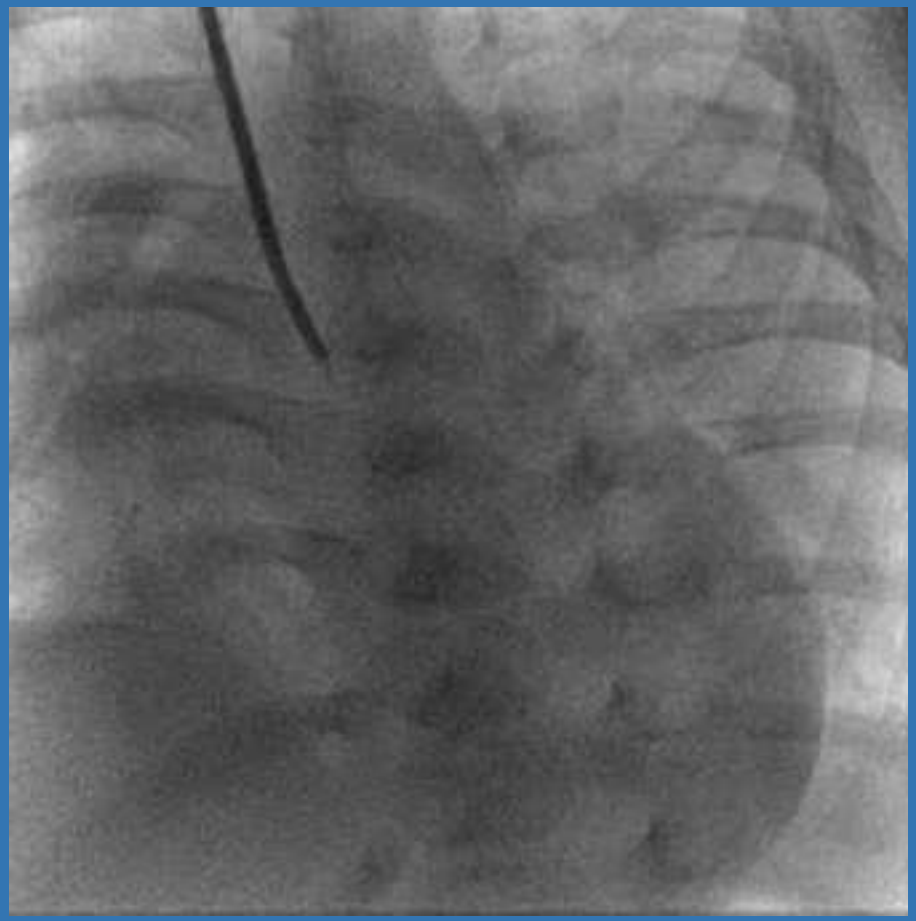
*Mcrindle (VACA investigators) Am J C 1996;77:286-293

# Neonatal aortic valve stenosis

## Carotid approach

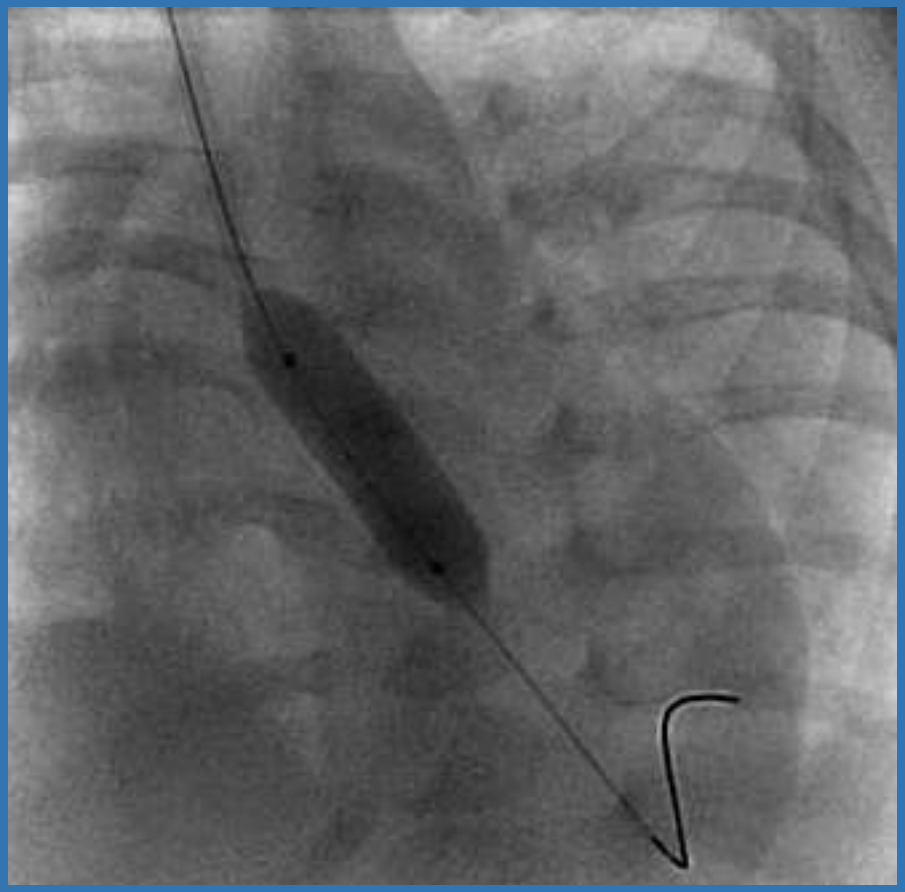
Neonatal Critical aortic stenosis
BP 55/38 m 43 mmHg
Gradient 74 mmHg
Valve diameter 5.8 mm
5.5mm mini ghost:
Gradient 53 mmHg
Trivial regurgitation

OK?



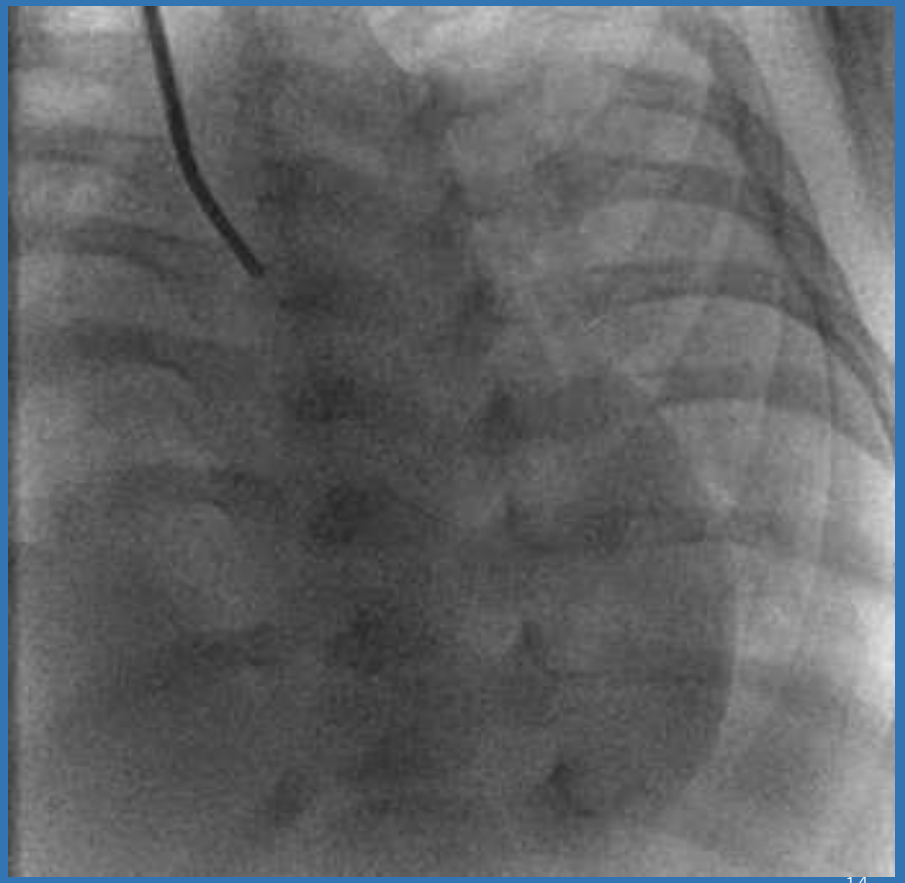
# Neonatal aortic valve stenosis

## Tyshak 6mm



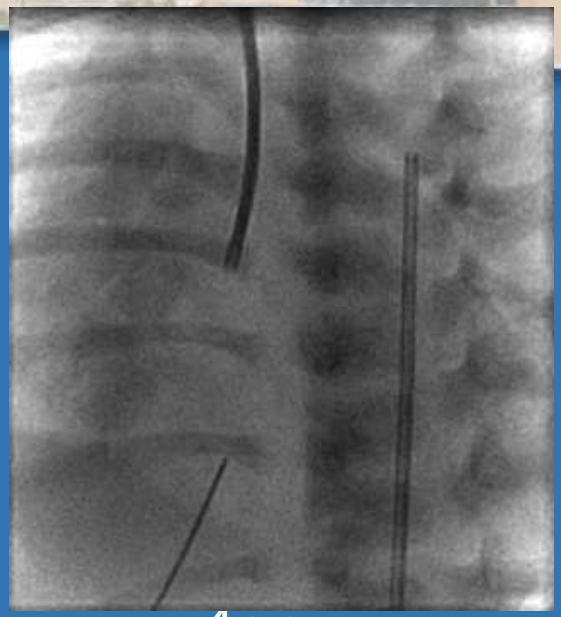
# Neonatal aortic valve stenosis

Post 6mm Tyshak
Gradient 23 mmHg

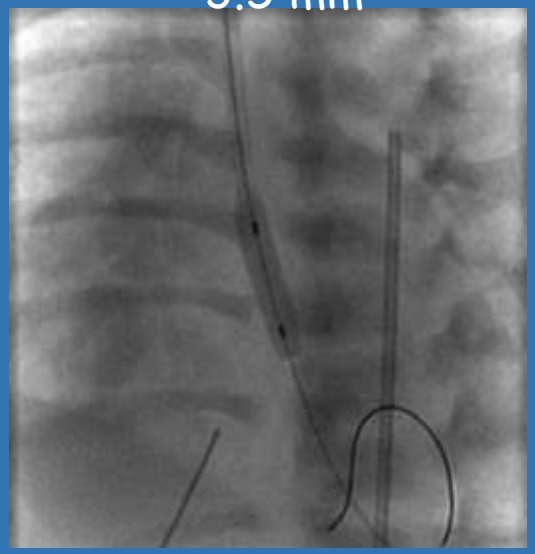


# Balloon increments 0.5mm

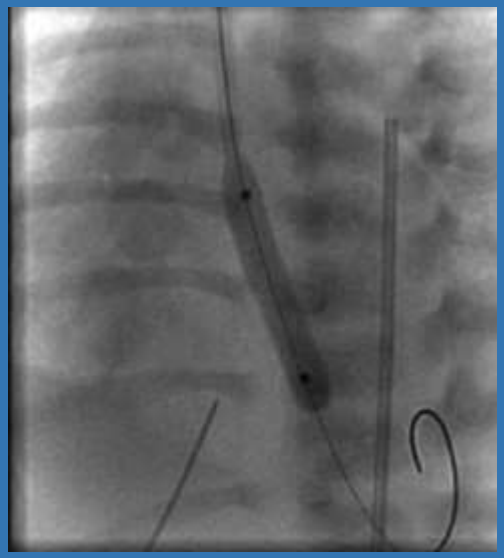
On PGE
Gdt 71mmHg
EDP 12mmHg
'Annulus' 4.2mm



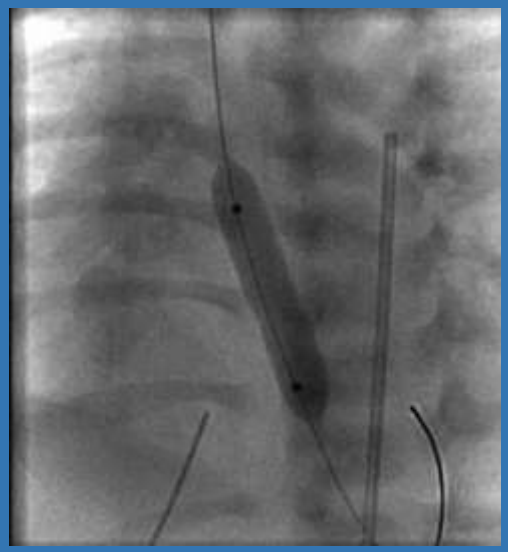
3.5 mm



4 mm



4.5 mm



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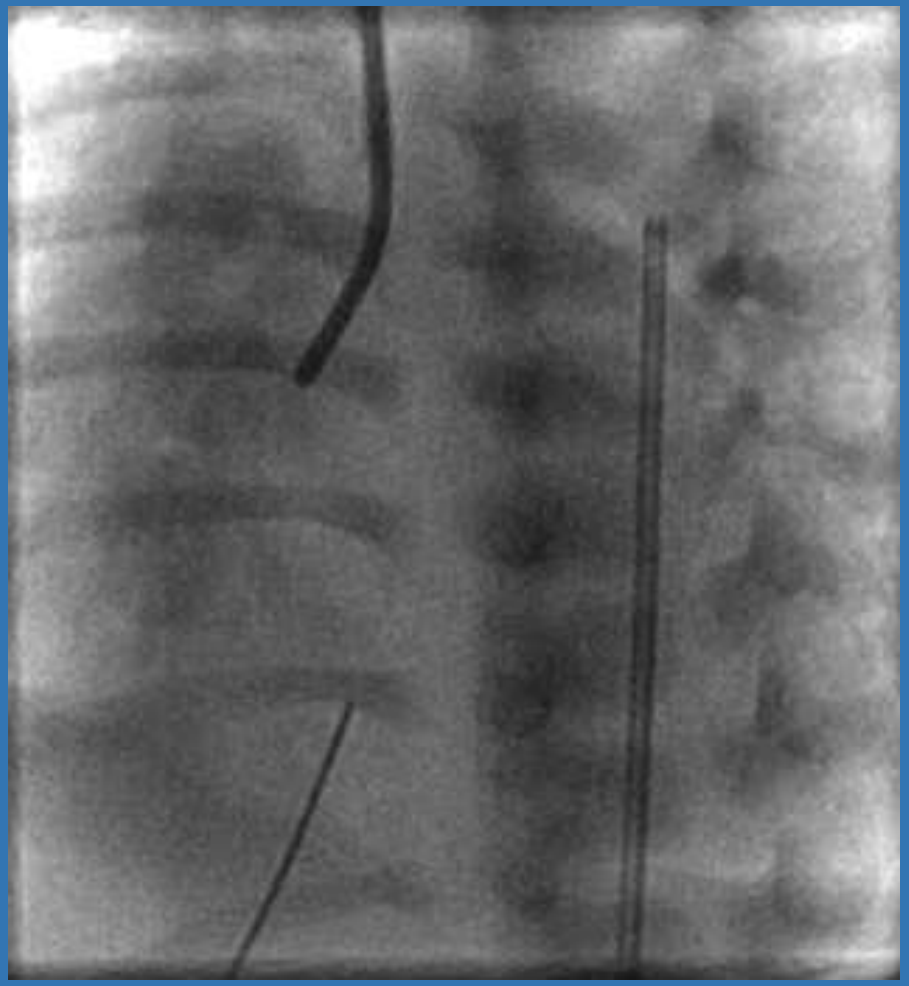
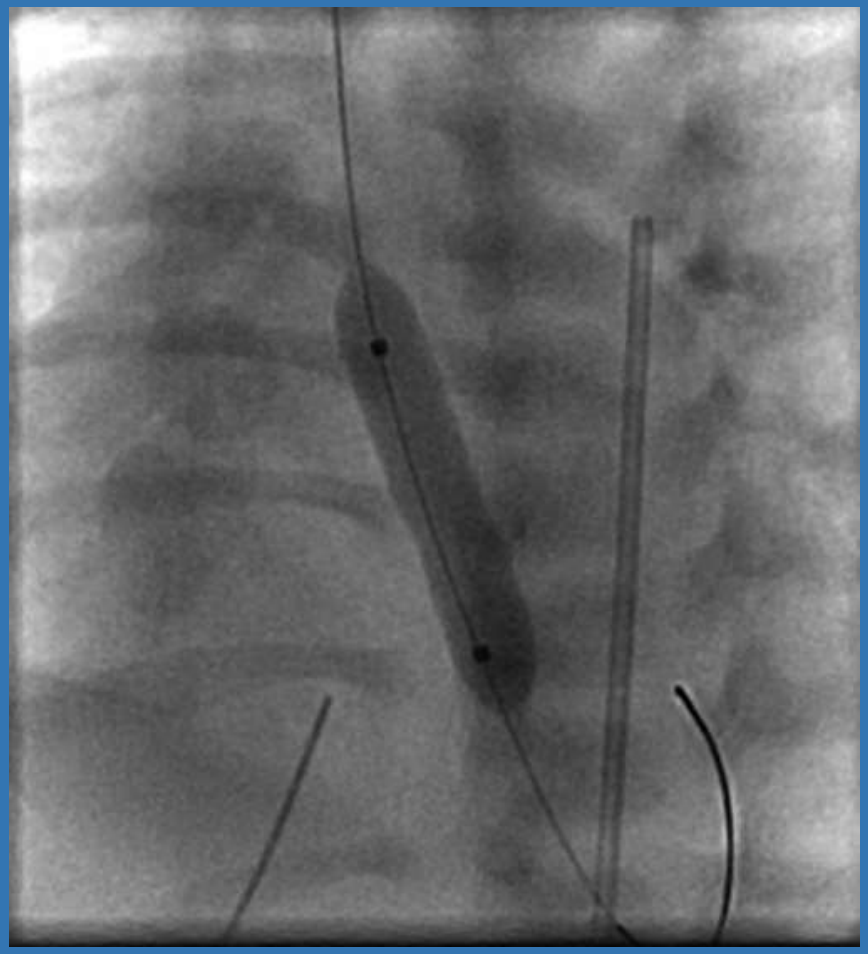
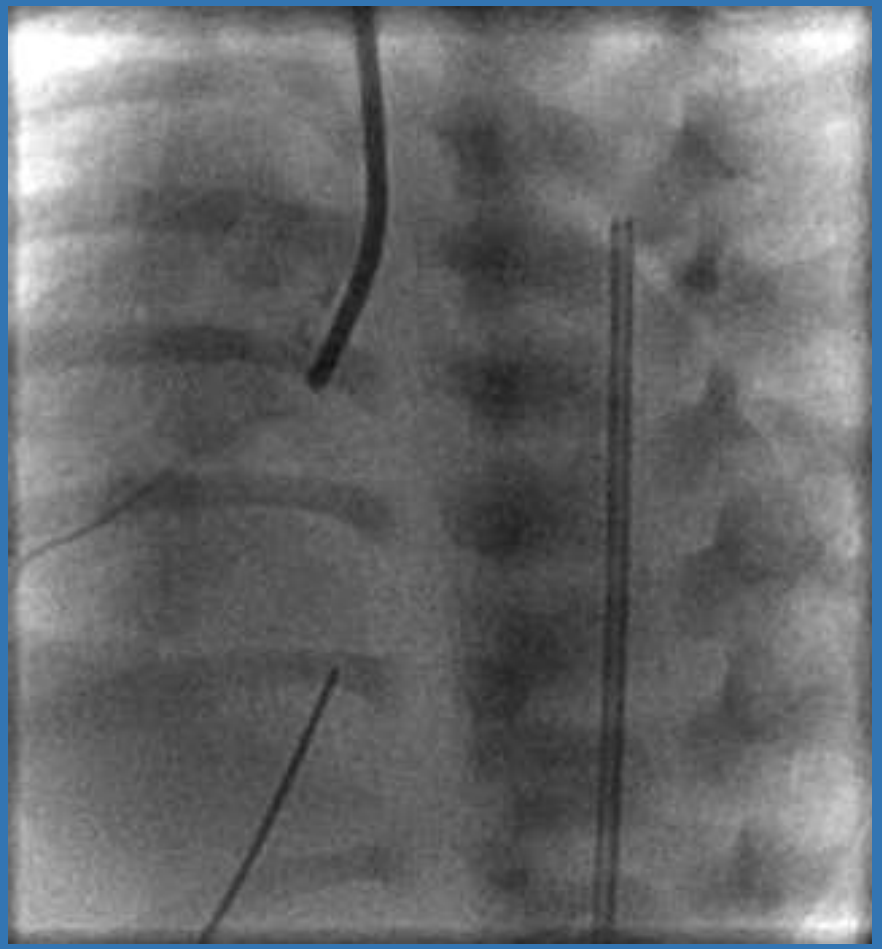
# No change in LV systolic or EDP



# Balloon to 5mm

Gradient 20mm Hg No change EDP (12mm)





# Some Observations

Better is the enemy of good

- Gradient?
- Role of better output
- Better means of measuring output acutely

In borderline hearts be prepared to accept that triage might have been wrong

- Conversion to Norwood or Hybrid
- Ross if severe AI

# Conclusions Tips and tricks

- Patient selection is key
- Good logic for a carotid approach
- Not really a technically difficult procedure but as always thorough routines, care and knowledge of equipment are vital
- Start with a small balloon and increase in size gradually assessing the result after each inflation but you still may lose the battle!