When and How to enlarge a small aortic root

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When to enlarge a small aortic root?

How small is small?

When aortic valve annulus

Z score < -2.5 to -3.0
Figure 8 Scatter plot of the aortic valve annulus dimension versus BSA.
The Italian Ross Registry
305 pts in 11 centres
1990-2012

Early mortality of 27.6% for infants
vs 0.2% for older children

Very high use of Ross Konno in infants group (2/3)
The use of valve conserving operations / interventions to allow the children to grow, instead of applying the Ross operation in early infancy to minimise risk.
Congenital aortic stenosis with a hypoplastic aortic root and/or multiple levels of LVOT obstruction in neonates and infants
Ross / Konno can benefit the very young

- Borderline LV volume
- Abnormal myocardium
- Critical aortic stenosis
- Arch hypoplasia
- Smallish mitral valve
Midterm results of modified Ross/ Konno in neonates and Infants : Stanford

- 1994 -2010
- 24 pts (< 1y ) with AS, SHC, AAH with VSD
- Z score AV -3.0 +/- 2.0
- Acceptable LV sizes
- Preop BAV in 20 pts
- EFE resection (6) , infundibular muscle patch (23)
- One early death (5%) due to EFE and high EDP
- No late mortality
- Autograft integrity at follow up median 6-7 years
- RV conduit change 40% at 5 years

Maeda et al ATS 2012
Ross / Konno at GOSH

- 2004-2012
- 87 Ross
- 9 Ross/Konno in 11 infants / neonates
- One early mortality (10%) due to EFE and high EDP
- One late death due to high EDP
Mid term benefits

- No residual LVOT obstruction
- LV dimension tolerable
- BUT persistent pulmonary hypertension in some pts

Burch et al., Heart, 2004
Endocardial fibroelastosis, unfortunately no reliable way to detect this condition during the preoperative work up

Tuo et al., Pediatr Cardiol, 2012
How to enlarge a small aortic root

Ross / Konno using an infundibular patch and EFE resection
5 month, 6 Kg infant with severe AVS
Z score -1.5
balloon valvotomy x2
residual stenosis and AR
severe LVH and diastolic dysfunction
Ross / Konno and EFE resection
When to enlarge

Z score -2.5 / -3.0

The decision ultimately is one of clinical judgment, not mathematical certainty.
How to enlarge

For young patients with complex aortic valve disease (with LVOT involvement), Ross/Konno operation is probably the only option that can provide the best freedom from LVOT re-intervention.
Thank you
Conventional repair in the presence of ‘Small’ aortic valve

Obstructed TAPVC
IAA/CoA with VSD
Z scores of cardiac structures