Aortic regurgitation in the young - Is it time to rethink the guidelines?

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Topic(s):
Adult Congenital Heart Disease, Clinical

Citation:
Background Establishing surgical indication for aortic valve replacement or repair (AVR) in the setting of severe aortic regurgitation (AR) can be challenging in young patients. Current guidelines state patients should be operated based on symptoms, presence of left ventricular (LV) dysfunction (Ejection Fraction, EF =50%) or severely LV dilatation (LV end diastolic diameter, LVEDD =70mm or LV end systolic diameter, LVESD =50mm) 1.

Purpose Our goal was to study the change of the LV size and function in a cohort of young adults with severe AR after surgery and relate this to pre-operative ventricular characteristics.

Methods We reviewed all patients who underwent AVR in our centre between 2013 and 2018. The echocardiographic data was collected prior to, pre discharge and at 6-12 months after surgery. A ROC analysis was used to determinate the discriminative power of baseline LV diameters in predicting normalization of LV size pre discharge. Normal values were considered as per the guidelines3.

Results A total of 75 adult patients were included: mean age 25±10.5 years, 64% male. The majority (61%) had a bicuspid valve, 17% an autograft (previous Ross procedure), 10% developed AR after a VSD was closed, 6% had an arterial switch procedure, 3% a truncal valve and 3% Tetralogy of Fallot. 10% went for a Ross procedure, 60% received a bioprosthetic and 30% a mechanical aortic valve. The majority (61%) were completely asymptomatic.

The vast majority (88%) were operated with LVEDD =70mm (mean 60±6.9mm), 84% had a LVESD =50mm and 80% had an LVEF >50%. A significant reduction in LVEDD occurred within a few days from surgery: mean reduction 9.2 ±6.2mm, p<0.0001). No further significant reduction was observed in the follow up (average change -1.12±7.1mm, p=0.24). LVESD dropped by 3.4 ±7.3mm (p<0.0001) immediately post-surgery and a further 3.32±9.6mm (p=0.12) after. Immediately post surgery there was a significant reduction in the LVEF (6.9±9.6%, p<0.0001), which however improved significantly (6% ±9.8, p<0.001) on the follow up. As a result, there was no significant change in LVEF from baseline to the latest follow up (change ±1%, p=0.57).

On ROC analysis the baseline LVEDD and LVESD were excellent predictors of lack of normalization of LV size post surgery (AUC=0.82, 95%CI: 0.70-0.94 and AUC =0.79, 95%CI 0.66-0.92, respectively). Sensitivity and specificity for normalization of LVEDD were 87% and 73%, with a preoperative LVEDDD cut-off value of =61mm. A cut off point of 42mm on the LVESD achieved a sensitivity of 83% and specificity of 65%.

Conclusions. In our practice we tend to operate on young patients with severe AR earlier than stated in the guidelines. Our data supports this approach, demonstrating that patients with significantly increased LV diameters prior to surgery do not tend to remodel in the first postoperative echo. Despite operating early, patients with LV EF <55% are less likely to normalize the LV size in the post operative period.
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Purpose Our goal was to study the change of the LV size and function in a cohort of young adults with severe AR after surgery and relate this to pre-operative ventricular characteristics.

Methods We reviewed all patients who underwent AVR in our centre between 2013 and 2018. The echocardiographic data was collected prior to, pre-discharge and at 6-12 months after surgery. A ROC analysis was used to determine the discriminative power of baseline LV diameters in predicting normalization of LV size pre-discharge. Normal values were considered as per the guidelines 3.

Results A total of 75 adult patients were included: mean age 25±10.5 years, 64% male. The majority (61%) had a bicuspid valve, 17% an autograft (previous Ross procedure), 10% developed AR after a VSD was closed, 6% had an arterial switch procedure, 3% a truncal valve and 3% Tetralogy of Fallot. 10% went for a Ross procedure, 60% received a bioprosthetic and 30% a mechanical aortic valve. The majority (61%) were completely asymptomatic.

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On ROC analysis the baseline LVEDD and LVESD were excellent predictors of lack of normalization of LV size post-surgery (AUC=0.82, 95%CI: 0.70-0.94 and AUC = 0.79, 95%CI 0.66-0.92, respectively). Sensitivity and specificity for normalization of LVEDD were 87% and 73%, with a preoperative LVEDD cut-off value of = 61mm. A cut-off point of = 42mm on the LVESD achieved a sensitivity of 83% and specificity of 65%.

Conclusions. In our practice we tend to operate on young patients with severe AR earlier than stated in the guidelines. Our data supports this approach, demonstrating that patients with significantly increased LV diameters prior to surgery do not tend to remodel in the first postoperative echo. Despite operating early, patients with LV EF < 55% are less likely to normalize the LV size in the postoperative period.