

Coronary ostia patterning in conotruncal defects

Bajolle F. (1), Houyel L. (2), Laux D. (1), Bonnet D. (1).

Necker-M3C, Université Paris Descartes, Paris, France (1)

Centre Chirurgical Marie-Lannelongue, Université Paris-Sud, Paris, France (2)

Introduction: Abnormal coronary ostia are frequently associated with conotruncal defects particularly with common arterial trunk. Our hypothesis is that these anomalies of coronary ostia in human could be related to variations in the location and size of the myocardial subpulmonary and subaortic domains.

Methods: In order to determine if abnormal outflow tract development influences coronary ostia position, we reviewed heart specimens with conotruncal defects : 46 common arterial trunk (CAT), 29 tetralogy of Fallot with pulmonary atresia (TOF&PA), 15 tetralogy of Fallot (TOF), 11 double-outlet right ventricle with subaortic ventricular septal defect (DORV) and 17 normal anatomy (control).

Position of the coronary ostia over the aortic or truncal circumference was measured in degrees as the direction from the middle of the valvar orifice.

Results: The left coronary ostium was more posterior in conotruncal defects vs control (mean angle : control=0°, TOF=31°, TOF&PA=47°, DORV=44°, CAT=65°, $p<0.005$) especially in CAT vs other conotruncal defects ($p<0.05$). The right coronary ostium was more anterior in TOF, TOF&PA and DORV vs control (mean angle : control=213°, TOF=242°, TOF&PA=245°, DORV=271°, $p<0.05$) especially in DORV vs TOF and TOF&PA ($p<0.05$), but not in CAT (195°). The anterior intercoronary angle, which corresponds to the pulmonary identity domain, was similar in TOF, TOF&PA, DORV and control (133°-162°) but significantly larger in CAT (229°, $p<0.0001$).

Conclusion: Coronary artery ostia distribution is very disturbed in conotruncal defects. The type of abnormal pattern is different depending on the type of defect involved. In anomalies of rotation only (TOF, TOF&PA, DORV with subaortic VSD), the anterior intercoronary angle remains constant but the lateral shift of the coronary ostia varies according to the degree of outflow tract rotation. The marked difference between CAT and other conotruncal defects could reflect the impact of the absence of aortopulmonary septation on the width of the subpulmonary domain.