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**Background:** Coronary artery status in adults longterm after the arterial switch operation (ASO) is unclear. As a consequence, current follow-up strategies for coronary assessment remain controversial. We conducted a systemic review to provide an overview of coronary complications during adulthood and to evaluate the value of coronary imaging in adults after ASO, in light of current guidelines. **Material and Method:** Studies describing coronary complications or coronary imaging after ASO in adults were considered eligible for review and analysis. Articles were screened for the inclusion of adult ASO patients and data on coronary complications and findings of coronary imaging were collected. In cohort studies with both adults ( $\geq 18$  years) and non-adults ( $< 18$  years) only outcomes in identifiable adults were analyzed.

**Results:** A total of 993 adults were followed with a median follow-up of 2.0 years after reaching adulthood. Myocardial ischemia was suspected in 16/192 patients (6.8%). The number of coronary interventions was 4 (0.4%) and coronary death was reported in 4 (0.4%) patients. The following coronary abnormalities were found by routine coronary computer tomography CT (cCT): stenosis (4%), acute angle (40%), kinking (24%) and interarterial course (11%). No coronary events were reported during pregnancy (n= 45).

**Conclusion:** The reported number of coronary interventions (0.4%) and of coronary death (0.4%) during a median follow-up of 2 years in 993 ASO adults is low. Coronary abnormalities including acute angle, kinking and interarterial course were commonly found by cCT. The 2020 European Society of Cardiology (ESC) guidelines state that routine screening for coronary pathologies is questionable. However, based on current findings and in line with the 2018 American ACC/AHA guidelines we suggest a baseline assessment of the coronary arteries in all adult ASO patients. Thereafter, an individualized coronary follow-up strategy, based upon coronary findings, is advisable.

#### Poster Gallery

##### THE CORONAVIRUS DISEASE 2019 PANDEMIC AMONG ADULT CONGENITAL HEART DISEASE PATIENTS: FINDINGS OF A ONE-YEAR MULTICENTRIC, INTERNATIONAL STUDY

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**Introduction:** In March 2020, no evidence on outcomes among adults with congenital heart disease (ACHD) with the Coronavirus Disease 2019 (COVID-19) was available.

**Material and Methods:** We collected reported COVID-19 cases among ACHD patients followed at 26 tertiary care centers in 10 European countries between March 27, 2020 and March 25, 2021. Information related to demographics, COVID-19 course, heart defect and medical history were recorded. Cases were stratified into first vs. subsequent COVID-19 waves (cut-off date July 15, 2020). A complicated disease course was defined as hospitalization for COVID-19 requiring ventilation and/or inotropic support, extracorporeal membrane oxygenation or death.

**Results:** We included 548 cases (first wave: n=161; subsequent waves: n=387). Median age was 33 (26-44) years, and 52% were female. Thirty-three (6%)

patients had a complicated disease course. Between waves (first vs. subsequent), there were no statistically significant differences related to gender (women 57% vs. 49%, p=0.09), body mass index (BMI) category (p=0.7), heart defect complexity (p=0.08) and residual heart defect-related problems (p=0.6). Patients in the first wave were older, had more often  $\geq 2$  comorbidities and a complicated disease course (37 vs 33 years, p=0.001; 17% vs. 7%, p=0.0003; and 9% vs. 5%, p=0.04, respectively). However, deaths were rather equally distributed (4% vs 2%, p=0.2) between waves. From multivariable models, adjusted odds ratios for the prediction of complicated COVID-19 course are depicted in the table.

**Conclusion:** Complicated COVID-19 course among ACHD patients is rare. Outcomes in the first wave were significantly worse when compared to subsequent waves, mainly because patients of the first wave were older and had more comorbidities. Age, cyanotic heart disease, having  $\geq 2$  comorbidities and a BMI  $> 25$  kg/m<sup>2</sup> were the main predictors for a complicated disease course.

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##### TRADITIONAL CARDIOVASCULAR RISK FACTORS ARE ASSOCIATED WITH ADVERSE CARDIAC EVENTS IN PREGNANT WOMEN WITH ELEVATED RIGHT VENTRICULAR SYSTOLIC PRESSURE

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**Background:** Elevated right ventricular systolic pressure (RVSP) of  $> 50$  mmHg and left ventricular dysfunction are established echocardiographic predictors of adverse cardiac events (ACE) in pregnancy. The aim of this study was to identify clinical variables associated with ACE during pregnancy in women with elevated RVSP.

**Materials and Methods:** Pregnant women with RVSP  $\geq 35$  mmHg (without right ventricular outflow obstruction or mechanical valves) were retrospectively identified and cardiac, obstetric and fetal outcomes in pregnancy were assessed. Clinical variables were evaluated for association with ACE.

**Results:** We identified 98 women (30  $\pm$  6 years-old, RVSP 44  $\pm$  10 mmHg, left ventricular ejection fraction [LVEF] 55  $\pm$  10%) with RVSP  $\geq 35$  mmHg (Figure A), and using simplified European Society of Cardiology (ESC) echocardiographic criteria classified them as low (n = 39 (40%)), intermediate (n = 46 (47%)), or high probability (n = 13 (13%)) for pulmonary hypertension (PH). A total of 30 ACE occurred in 25 women (26%) (Figure B), including heart failure (25 events / 20 women) and venous thromboembolism (5 events / 5 women). No maternal deaths occurred in pregnancy or through 42 days postpartum. On univariate analysis, pre-pregnancy hypertension, non-gestational diabetes, hypertensive disorders of pregnancy (HDP), LVEF  $< 50\%$  and RVSP  $\geq 50$  mmHg were associated with ACE, while risk was decreased for women with low echocardiographic PH probability (Figure C). In viable pregnancies, HDP occurred in 21 (31%), cesarean delivery in 47 (52%), preterm birth in 32 (53%) and fetal mortality in 1 (1%).

**Conclusions:** In pregnant women with elevated RVSP, traditional cardiovascular risk factors including pre-pregnancy hypertension, non-gestational diabetes, and HDP were associated with increased ACE during pregnancy, in addition to LVEF  $< 50\%$  and RVSP  $\geq 50$  mmHg. Low probability of PH by ESC criteria predicted a lower risk of ACE in pregnancy.

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##### TRENDS IN PATIENT CHARACTERISTIC, COST, AND IN-HOSPITAL MORTALITY AMONG MECHANICALLY VENTILATED ADULT PATIENTS WITH CONGENITAL HEART DISEASE IN THE UNITED STATES

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**Background:** There is an increasing number of adults with congenital heart disease (ACHD), but the outcomes of critically ill ACHD patients requiring mechanical ventilation (MV) remain understudied. The objective of this study was to evaluate patient characteristics and trends in the mortality and health care cost of mechanically ventilated patients with ACHD.