Prevalence of coronary anomalies in tetralogy of Fallot and its clinical implications, a meta-analysis

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Background: In literature, anomalous coronary arteries from the opposite sinus of Valsalva or opposite coronary artery (ACAOS) are reported between 2% to 39% of patients with Tetralogy of Fallot (TOF). Knowledge of coronary anatomy prior to corrective surgery is vital to avoid damage to vessels crossing the right ventricular outflow tract (RVOT). The current range of reported prevalences is broad and a general overview comparing current knowledge on anomalous coronary arteries in TOF is lacking to date.

Purpose: In this meta-analysis, we aim to provide a detailed overview of current knowledge on prevalence of coronary anomalies in TOF and discuss the implications for patient management.

Methods: PubMed, Embase and Web of Science were searched for articles on TOF and coronary anomalies. Analysis was done using Revman 5.3 (Cochrane Community, London). The primary analysis focused on the origin and proximal course of the right and left coronary arteries. Also, the prevalences of large conus arteries and coronary arteriovenous fistulas were calculated.

Results: Twenty-nine studies, comprising 6977 patients all together, were included for primary meta-analysis of ACAOS. 6% of TOF patients have an ACAOS. Of these anomalous vessels, 72% crosses the RVOT. 6% of patients have a large conus artery and 4% a coronary arteriovenous fistula. Other incidentally reported coronary anomalies in TOF include a left or right coronary artery originating from the pulmonary artery, an accessory left anterior descending artery, hypoplasia of the entire coronary tree and anastomoses between coronary and bronchial arteries. CT-angiography is the imaging modality of preference because of its high spatial resolution. Transthoracic echocardiography can be used in younger children as well for discerning the coronary anatomy. Most surgical approaches can be adapted to an anomalous coronary artery coursing over the RVOT.

Conclusions: Coronary anomalies have a high prevalence in TOF. An ACAOS occurs in 6%, large conus arteries exist in 6% and coronary arteriovenous fistulas in 4% of cases. A substantial part crosses the RVOT. This has to be taken into account during surgery.
Overall prevalence of ACAOS in TOF