

Figure 2: Bland–Altman plots demonstrating agreement between TTE and CTA measurements of the right pulmonary artery.

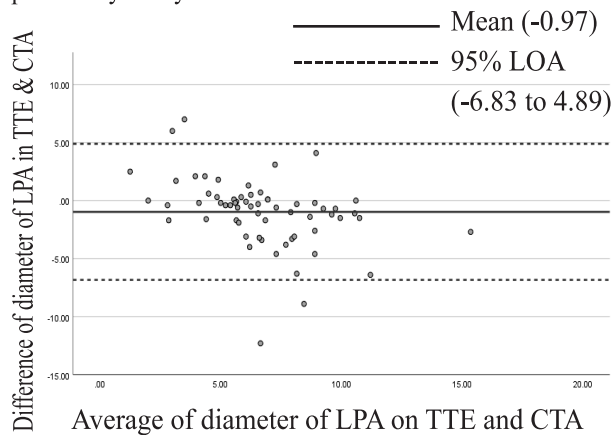


Figure 3: Bland–Altman plots demonstrating agreement between TTE and CTA measurements of the left pulmonary artery.

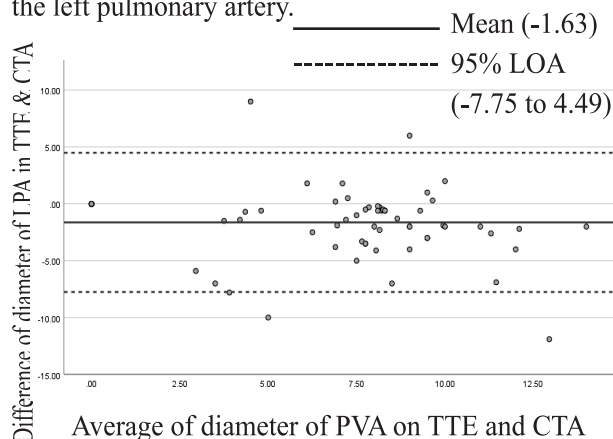


Figure 4: Bland–Altman plots demonstrating agreement between TTE and CTA measurements of the right pulmonary valve annulus.

DISCUSSION

Congenital Cyanotic Heart diseases with TOF physiology need an in-depth information of the pulmonary arteries & the pulmonary valve annulus for preoperative planning and inclusion and exclusion of patient for various procedures.¹⁴ These information's are also important for predicting long-term complications and prognosis after the procedure.⁸ Since 1967 TTE has been used as a diagnostic tool for congenital heart disease.^{15,16}

It is proven that TTE provides good enough information for intra cardiac structures, i.e., different

valves, chamber morphology, dimensions, hemodynamics & intracardiac shunts.^{17,9}

TTE has limited acoustic window so cannot evaluate the extra cardiac structures, i.e., pulmonary artery's distal part, aortic branches, and all pulmonary veins. For detail evaluation of pulmonary artery & extra cardiac anomaly CTA is preferred modality of choice when TTE is unequivocal.¹⁸

In our study, the difference between the mean diameter of the pulmonary valve annulus measured by TTE and CTA was 1.6 mm, which is similar to Sathio et al.¹⁰ Correlation analysis showed statistically significant associations between the two modalities for all pulmonary arteries and the annulus ($P < 0.001$), with the strongest correlation observed for the annulus ($r = 0.719$). The other vessels also demonstrated moderate to strong correlations, indicating good overall agreement. Bland–Altman analysis further confirmed small mean differences, supporting the reliability of echocardiography for assessing pulmonary valve and artery dimensions. These findings are consistent with Sathio et al., who reported similarly strong correlations and minimal bias between TTE and CTA measurements.¹⁰

In our study, we saw that who needed corrective or palliative surgery, the provisional surgical plan that was taken based on TTE did not change in the majority of cases even after the CTA, if the TTE provided enough information. In our study cases were diagnosed as PA atresia, DORV-TOF in TTE, later on diagnosed as simple TOF, TGA-TOF in CTA. TEE has some limitations as, its limited acoustic window, inability to evaluate extracardiac structures, i.e., distal LPA, RPA, aortic branches, full length aorta. Thus, when TTE is unequivocal, CTA has been a preferred modality for pulmonary artery & extra cardiac structures evaluation.¹⁸

To decide the type of corrective surgery for TOF, i.e., intracardiac repair with valve-sparing or trans-annular patch, the pulmonary valve annulus is one of the determinants. The annular sparing surgeries carry preferable early surgical outcomes.¹⁹ Previously, conventional angiogram was gold standard for