# [Assessment and Implications of Right Ventricular Afterload in Tetralogy of Fallot.](https://www.ncbi.nlm.nih.gov/pubmed/31586531)

Egbe AC, Taggart NW, Reddy YNV, Sufian M, Banala K, Vojjini R, Najam M, Osman K, Obokata M, Borlaug BA.

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**Take-Home Points:**

* High RV pressure after repair of tetralogy of Fallot (TOF) adversely affects clinical outcomes.
* Invasively measured right ventricular systolic pressure (RVSP) and TOF with pulmonary atresia are independent risk factor for death and/ or heart transplant.
* Doppler-derived RVSP has good correlation between invasively measured RVSP and is independently predictive of death and / or heart transplant.



***Commentary by Dr. M.C. Leong (Kuala Lumpur, Malaysia), section editor of ACHD Journal Watch:***In the attempt to preserve the pulmonary valve during surgery, surgeons usually leave patients with residual right ventricular outflow tract (RVOT) obstruction either at the pulmonary annular or perivalvular level after the repair of tetralogy of Fallot (TOF). Often, this is seen as benign as the residual RVOT is usually not high and in fact, may even promote development of restrictive right ventricular physiology which may mitigate progressive right ventricular dilatation. However, if the right ventricular systolic pressure is left high for a chronic period of time, its long term effect onto the right ventricle is unknown. This paper studied the effect of significant elevated right ventricular afterload, whether it independently affects the clinical outcomes of patients with TOF.

This is a retrospective study, looking at 266 patients who underwent cardiac catheterization during follow up. Of these, 175 (66%) patients had significant RVOT obstruction, which was defined as a peak-to-peak gradient of greater than 36mmHg, on direct measurement. Within this cohort, 212 patients had echocardiography within 48 hours of the cardiac catheterization.

These patients were followed up for 12.9 ± 7.3 years from the time of invasive study. During this period 35 (13%) patients died at a mean age of 49 ± 14 years. Of these, 27 patients had significant RVOT obstruction while 8 patients did not. There was no significant difference in mortality between patients with versus without significant RVOT obstruction. Invasively measured RVSP and TOF-pulmonary atresia were independent risk factors for death and/or heart transplant.



There was a strong correlation between the invasively measured right ventricular systolic pressure (RVSP) and that of echocardiographic Doppler-derived, with a mean difference of +6mmHg suggesting that follow up using echocardiography is accurate yet noninvasive. Doppler-derived RSVP was independently predictive of death and / or transplant.



It is interesting to note that TOF-pulmonary atresia itself was a risk factor for death and heart failure. With increasing attempts of unifocalization of the aorto-pulmonary collaterals and incorporating them into the pulmonary arterial tree as well as total repair when the pulmonary arterial size is less than desired, many patients are left with high RVSP and this paper underscores the effects of having a high RVSP in this group of patients. A caveat to this paper is the fact that patients who undergo invasive investigation are those with poorer hemodynamics and inherently are at a higher risk of death and heart failure. Hence many of these patients are higher risk patients compared to the general TOF population.