

Abstract Submitted
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Study of the Pressure and Velocity Across the Aortic Valve
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KYUNG, SI YOUNG CHOI, Choice Research Group — Biomechanics of the heart,
requiring an extensive understanding of the complexity of the heart, have become
the interests of many biomedical engineers in cardiology today. In order to study
aortic valve disease, engineers have focused on the data obtained through bio-fluid
flow analysis. To further this study, physical and computational analysis on the
biomechanical determinants of blood flow in the stenosed aortic valve have been ex-
amined. These observations, along with the principles of cardiovascular physiology,
confirm that when blood flows through the valve opening, pressure gradient across
the valve is produced as a result of stenosis of the aortic valve. The aortic valve
gradient is used to interpret the increase and decrease on each side of the defective
valve. To compute different pressure gradients across the aortic valve, this paper
analyzes Aortic Valve Areas (AVA) using simulations based on the continuity equa-
tion and Gorlin equation. The data obtained from such analysis consist of patients
in the AS category that display mild Aortic Valve Velocity (AVV) and pressure
gradient. Such correlation results in the construction of a dependent relationship
between severe AS causing LV systolic dysfunction and the transaortic velocity.

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