

Tissue Doppler study of Right Ventricular strain before and after Balloon Mitral Valvuloplasty

By

Maged Tewfik Fahim

M. B. B. Ch

Under supervision of

Prof. Osama Abd El Aziz Rifaie

Professor of Cardiology

Ain Shams University

Dr. Mohamed Ismail Ahmed

Lecturer of Cardiology

Ain Shams University

Department of Cardiology

Ain Shams University

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Abbreviations

A	late diastolic strain rate
ACC	American college of cardiology
AF	atrial fibrillation
AHA	American Heart Association
AR	aortic regurgitation
ASD	atrial septal defect
A₂	aortic component of the second heart sound
BMV	balloon mitral valvuloplasty
BSA	body surface area
dST	diastolic strain
E	early diastolic strain rate
ECG	electrocardiography
Fw	free wall
ICT	Isovolumic contraction time
IVRT	isovolumic relaxation time
LV	left ventricular
MPG	mean pressure gradient
MR	mitral regurgitation
MRI	Magnetic resonance imaging
MS	mitral stenosis
MV	mitral valve
MVA	mitral valve area

NYHA	New York Heart Association
OS	opening snap
P₂	pulmonary component of second heart sound
ROI	region of interest
RV	right ventricular
RVSP	right ventricular systolic pressure
S	systolic strain rate
SR	Strain rate
SRI	strain rate imaging.
sST	systolic strain
STS	Society of Thoracic Surgeons
S₁	first heart sound
S₂	second heart sound
S₃	third heart sound
S₄	fourth heart sound
TDE	Tissue Doppler echocardiography
tdST	total diastolic strain
TEE	transesophageal echocardiography
TR	tricuspid regurgitation
tsST	total systolic strain
TVI	tissue <i>velocity</i> imaging

Introduction

Recently, the value of right ventricular (RV) function as a prognostic factor has been recognized in various pathological situations, including heart failure, myocardial infarction, and pulmonary embolism (1-3). However, the assessment of RV contractile function remains cumbersome, likely because of the complex anatomy and thin wall structure of the RV.

RV volumes and ejection fraction can be estimated using either radionuclide angiography, magnetic resonance imaging, or three-dimensional echocardiography(4-6) . However, a comprehensive approach to RV function would require the assessment of not only the global performance but mostly the regional heterogeneity of RV contraction (7).

The development of new quantitative echocardiographic techniques such as ultrasonic strain & strain rate (SR) imaging , has enhanced the ability to non invasively assess regional myocardial function. Strain representing the relative magnitude of segmental systolic shortening and its temporal derivative, the Strain rate (SR) i.e. the maximal velocity

of systolic shortening, is considered as an accurate index of myocardial contractility, capable of differentiating regional myocardial contractions from hypokinetic ones. It is not dependent on adjacent myocardial motion or heart translation.

Balloon Mitral valvuloplasty is considered the treatment of choice for patients with Rheumatic Mitral stenosis yet the immediate results on RV pressure overload relieve is not detected by conventional 2D & Doppler studies.

The RV segmental & global function improvement is not detected by conventional immediate echocardiographic study, the evolution of new tissue Doppler derived technique might aid to the study.