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# **CARDIOVASCULAR RESEARCH PROVE JOURNAL (CVREP)**

**CARDIOVASCULAR RESEARCH PROVE Journal**

**“CVREP” Journal**

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**“CVREP” Journal** is the official Journal of **CardioAlex Research, Education & Prevention foundation**. It is a peer-reviewed journal, engaged in publishing high quality material on all aspects of Cardiovascular Medicine. It includes updates on cardiology, information to junior doctors, review articles, abstracts, articles related to research findings and technical evaluations. It also provides a forum for the exchange of information in all fields of cardiology.

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## **Aortic Valve Endocarditis Post Ventricular Septal Defect Device Closure**

*Yasser Mubarak, MD.*

*Professor of cardiothoracic surgery, Faculty of Medicine, Minia University, Egypt.  
Associate consultant of adult cardiac surgery, Madinah Cardiac Center, El Madinah, KSA.  
Assistant consultant of adult cardiac surgery, KFMC, KSHC, Saudi Arabia.*

### **Objective:**

Ventricular septal defect (VSD) is a common congenital heart disease (CHD) in childhood, and its incidence is about 20% of CHD (1). Surgical closure or repair is safe with acceptable results. Transcatheter VSD closure offers excellent results (2).

Coil system is developed for transcatheter VSD occlusion. Infective endocarditis (IE) post device implantation is very rare, however it is possible.

IE represents a surgical challenge associated with perioperative mortality (3).

### **Methods:**

Post VSD device closure is a source of infection which is extended to aortic valve. Emergency case of infective endocarditis post VSD device closure, removal of device and surgical closure of VSD with pericardial patch. Also, aortic valve replaced by bioprosthetic valve as result of IE with removal all infected tissue.

### **Result:**

Excellent result without mortality or morbidity following IE post VSD device closure.

### **Conclusion:**

In spite of VSD device closure is safe and less invasive than surgery, infection of device and its extension to other structure like aortic valve leading to emergency surgical intervention with its complications

### **Keywords:**

Ventricular Septal Defect, Device Closure, Infective endocarditis.

# Assessment of Left Atrium Volume and Function in Rheumatoid Arthritis Patients by Three-Dimensional Transthoracic Echocardiography

*-Prof. dr. Alaa Mohamed Ibrahim: professor of cardiology Faculty of Medicine, Minia University.*

*-Dr. Ahmed Hamdy Shehata Mohamed: assistant lecturer in cardiology department, Faculty of Medicine, Minia University, Egypt*

## Background:

Rheumatoid arthritis is the most common systemic autoimmune disease and affects approximately 1-3% of people worldwide. It is an invalidating disease associated with changes in life quality and reduced life expectancy. Among extra-articular complications, cardiovascular involvement represents one of the leading causes of morbidity and mortality. Left atrial (LA) volume and function are crucial and serve as useful predictors of cardiovascular outcomes as AF, Congestive heart failure, stroke and death.

## Aim:

The aim of this study is to assess the LA volume and function by 3D three-dimensional echocardiography in RA patients. Subjects and Subjects.

## Methods:

This study was conducted on 60 patients with Rheumatoid arthritis who were diagnosed according to the criteria of the American college of rheumatology classification for RA (ACR/EULAR 2010) attending the rheumatology and rehabilitation out-patient clinic at Minia university hospital during the period from september 2019 to september 2020.

Patients were classified into active RA group (group A) and remittent RA (group B) according to simplified disease activity index (SDAI) score in addition to 30 healthy subjects with similar age and sex as a control group.

Exclusion criteria:

. systemic HTN, DM  
Already existing cardiac diseases (echocardiographic evidence of regional or global wall motion abnormalities, Significant valvular

heart disease, atrial fibrillation, Congenital heart disease) Advanced renal disease. Advanced liver disease. Chronic obstructive air way diseases. Poor image quality.

## Methods:

All participants included in the study were subjected to:

- 1-Thorough history taking and clinical examination, 12 leads ECG.
- 2-Routine laboratory investigations.
- 3-Conventional 2D trans-thoracic echocardiography.
- 4- 3D trans-thoracic echocardiography.

Statistical analysis: Statistical analysis was conducted using the Statistical Package for Social Sciences (SPSS software version 25).

## Results:

3D echocardiographic parameters of LA volumes (LAV max, LAV min, LAV preA) are significantly increased while the parameters of LA function (AEF, PEF, EI) are significantly impaired. Especially during disease activity ( $p < 0.01$ )

## Conclusion:

Three-dimensional echocardiography of LA revealed increased LA volumes and impaired LA phasic function in RA patients, especially during disease activity .

## Keywords:

Rheumatoid arthritis(RA),  
left atrium (LA),  
three-dimensional Echocardiography (3DE).

## Less Invasive Approaches for Mitral Valve Surgery, Between Patient Satisfaction And Affordability

Mohamed Zayed<sup>1\*</sup>, Tamer El Banna<sup>1</sup>, Mohamed Makram<sup>2</sup>, Mohamed Ramadan<sup>2</sup>,  
Mohamed A. Metwally<sup>3</sup>

<sup>1</sup> Department of Cardiac Surgery, National Heart Institute (NHI), Giza, Egypt

<sup>2</sup> Department of Cardiology, National Heart Institute (NHI), Giza, Egypt

<sup>3</sup> Department of Cardiology, National Diabetes Institute (NDI), Cairo, Egypt

\*Corresponding author: MOHAMED MAHMOUD ZAYED. National heart institute (NHI), Cairo, EGYPT.

### Background:

Full median sternotomy has been a standard surgical approach for heart surgery for more than 50 years. Several advantages increasing the use of less invasive approaches to the mitral valve surgery including, cosmetic, blood product use, respiratory, and pain advantages over conventional surgery. Parasternal incision, right mini-thoracotomy and partial sternotomy are described approaches for less invasive cardiac surgery.

### Objective:

Comparing the less invasive approaches via upper partial sternotomy vs right mini-thoracotomy in mitral valve surgery.

### Methods:

Sixty patients, underwent mitral valve surgery in NHI, were enrolled in this study and divided into two equal groups, and randomly assigned into two equal groups: group upper mini-sternotomy (UMS group, n = 30) or group RMT group (n = 30). The preoperative characteristics, operative variables, mortality, and morbidity were analyzed prospectively.

### Results:

No difference was found between the two groups as regards the mortality. However, in Group UMS, blood loss was higher, also cross clamp time and total bypass time were longer without significant difference. RMT group showed less time on mechanical ventilation, ICU stay and total hospital stay. In Group UMS, two patients (7%) developed superficial wound infection, and one patient (3%) required permanent pacemaker.

### Conclusion:

Both approaches are Upper partial sternotomy and right mini thoracotomy are considered a safe alternative for mitral valve replacement, and can provide adequate exposure for mitral valve. In Upper partial sternotomy, conventional cardiopulmonary bypass, no specific instruments or endoscope were needed. In right mini thoracotomy, a longer learning curve and special instruments were required, however, it carried better outcome considering patient satisfaction for pain and cosmetic outcome and comparable results in the hospital stay and short return to activity.

## **Median Sternotomy for Surgical Closure of Secundum ASD, Is It Still an Option?**

*Aly Emad<sup>1</sup>, Mohamed Zayed<sup>1\*</sup>, Ahmed Mohanad<sup>2</sup> and Rasha Hosny<sup>3</sup>*

*<sup>1</sup>Cardiac Surgery Department, National Heart Institute (NHI), Egypt <sup>2</sup>Cardiology Department, National Heart Institute (NHI), Egypt <sup>3</sup>Anesthesiology Department, National Heart Institute (NHI), Egypt.*

*\*Corresponding author: MOHAMED MAHMOUD ZAYED. National heart institute (NHI), Cairo, EGYPT.*

### **Background:**

Ostium secundum ASD used to be surgically closed using the standard median sternotomy, Improvement in surgical techniques encouraged many surgeons to use minimally invasive approaches as an alternative to the conventional one.

### **Aim of the work:**

To evaluate the outcome and effectiveness of the right mini thoracotomy approach as an alternative for the median sternotomy for surgical repair of secundum ASD.

### **Methods:**

This is a prospective observational study done on 50 adult patients diagnosed with ASD of ostium secundum type, indicated for surgery and not amenable to device closure. They were divided into two equal groups: group I, represented 25 patients who underwent ASD repair through conventional median sternotomy (CMS), and group II represented 25 patients underwent right mini thoracotomy (RMT).

Comparison between groups was done regarding clamp time, bypass time, ventilation time and ICU and hospital stay.

### **Results:**

Our study showed that RMT patients had significantly smaller incision, less time of mechanical ventilation, less ICU and hospital stay, though having more bypass time when compared with the conventional median sternotomy. No operative or in hospital mortality with excellent patient satisfaction.

### **Conclusions:**

RMT used for surgical closure of secundum ASD is a safe and effective procedure showing many advantages over sternotomy, and can be used as a routine approach for such cases.

### **Keywords:**

ostium secundum, atrial septal defect, right mini thoracotomy, cardiac surgery, minimally invasive.



## Role of intracoronary adenosine on prevention of no reflow during Primary PCI in STEMI patients guided by MVO in CMR

Ahmed Hatata<sup>1</sup>, Wael EL-Kilany<sup>2</sup>, Ahmed Rezk<sup>3</sup>, Tarek Zaki<sup>4</sup>

<sup>1</sup> Assistant lecturer of cardiology Ain shams University, Egypt <sup>2</sup> Professor of cardiology Ain shams University, Egypt <sup>3</sup> Lecturer of cardiology Ain shams University, Egypt

<sup>4</sup> Professor of cardiology Ain shams University, Egypt

Corresponding Author: Ahmed Ibrahim Hatata

### Background:

Microvascular obstruction (MO) or no-reflow phenomenon is an established complication of coronary reperfusion therapy for acute myocardial infarction. It is increasingly recognized as a poor prognostic indicator and marker of subsequent adverse LV remodeling. Microvascular obstruction (MO) or no-reflow phenomenon is an established complication of coronary reperfusion therapy for acute myocardial infarction. It is increasingly recognized as a poor prognostic indicator and marker of subsequent adverse LV remodeling.

### Methods:

#### Study design:

This is an interventional prospective pilot study which was conducted on patients presenting to cardiology department in Ain Shams University hospitals with STEMI (ST segment elevation myocardial infarction in the first 12 hours of presentation.) DEFINED as elevation of cardiac troponins at least one value above 99th percentile in a clinical setting consistent with myocardial ischemia.

Sample size: 50 patients.

#### Inclusion criteria:

Patients presented with STEMI for primary PCI. Patients with TIMI I flow after establishing flow by PTCA wire or PTCA balloon or by thrombus aspiration. Coronary angiography shows total occluded vessel with TIMI zero flow. Thrombus burden grade five. Informed consent about adenosine is taken before procedure and hazards of adenosine are discussed with the patient and operator according to protocol.

### Exclusion criteria:

Lack of informed consent. Patients presented with cardiogenic shock. Patients with complete heart block or second degree heart block. Patient with CKD on dialysis. Previous myocardial infarction, CABG. ICM with low ejection fraction less than 35%. Evidence of previous ischemia (previous CA with significant CAD lesion more than 70% by coronary angiography or by IVUS or FFR).

### Results:

There was no significant difference between two groups regarding TIMI and MBG score. There was a significant difference in myocardial salvage index and myocardium at risk with  $p$  value less than 0.001. Yet no increase in myocardial hemorrhage among the two groups. There was significant improvement in EF, LV mass and LV volumes in those who were given adenosine.

### Conclusion:

Adenosine improves no reflow on giving as a prophylactic drug. It improves the microcirculation thus increasing the salvaged myocardium improving microvascular obstruction and does not increase the percentage of microvascular hemorrhage.

### Keywords:

STEMI, Coronary no-reflow, MVO, MV HGE, Salvage Index, TIMI, MBG adenosine.

## Safety and Mortality: Monitoring the Patients on Rivaroxaban

*Fakhr Z. AlAyoubi a\*1, Ghada ElGohary b, Shereen Dasuqi c, Ahmad Hayajneh a, Kazi Nur Asfina a, Samha AlAyoubi a  
a King Fahad cardiac Centre, College of Medicine, Department of Cardiac Sciences, King Saud University, Saudi Arabia;  
fayoubi@ksu.edu.sa; ahayajneh@ksu.edu.sa; kasfina@ksu.edu.sa; salayoubi@ksu.edu.sa  
b Oncology Hematology department, College of Medicine, King Saud University, Riyadh, Saudi Arabia; ghelgohary@gamil.com  
c University of Liverpool, (UK).*

### **Background:**

No enough information available in matter of patient on Rivaroxaban a direct factor Xa inhibitor specially in Saudi population. In addition, patient with chronic kidney disease, valvular atrial fibrillation or liver disease must not be considered for such therapeutic change. This study will be the first to give an idea about current practice being used at anticoagulant clinic and criteria used to choose patients were switched to Rivaroxaban.

### **Aim:**

This study will shed the light on the current practice and criteria used to choose patients to be switched to Rivaroxaban among patient attending ambulatory clinic. To identify criteria of safety to consider in the patient for transitioning treatment, as well as to specify the causes of reversing from warfarin to Rivaroxaban and side effects.

### **Methodology:**

Retrospective Observational study. Electronic Medical Records (eSiHi) of our hospital will be used to retrieve study variables, from 2015 until 2021, for Rivaroxaban patients.

### **Results:**

NOACs should be considered for almost all NVAF patients, considering their efficacy and safety profile. However, there are some specific populations that might benefit more from

switching from VKAs to NOACs. Labile INR has been identified as a risk factor for bleeding events and this variable is included in the HAS-BLED bleeding risk score, although the relative efficacy and safety of DOACs compared with warfarin was consistent across INR time in therapeutic strata.

### **Conclusion:**

Switching from the old anticoagulant drug Warfarin to a New Oral Anticoagulant (DOACs) Rivaroxaban has been an argument for a long time, Rivaroxaban is started when INR is between 2.5 – 2.9. Meanwhile; patients with high risk or bleeding are started once the INR is in the lower half of the target range (2.0–2.5). VKAs are still the most appropriate choice for some patients, it is important to consider that patients with end-stage renal disease were not included in DOACs trials; therefore, renal function should be evaluated and switching from VKAs to Rivaroxaban is not recommended when creatinine clearance is less than 30 mL/min.

Thus, it is recommended to monitor renal function during treatment in order to detect renal impairment early and, in some cases, change the dose of the NOAC or even stop it. There is no evidence supporting the use of these new drugs for these groups of patients and therefore VKAs should be maintained. Finally, cost is another issue to be considered before switching from VKAs to DOACs since the latter are more expensive than VKAs.

## Severe Rheumatic Tricuspid Valve Disease, To Repair or To Replace, Egyptian Experience

Ahmed M. Elwakeela\*, Ashraf A.H. El Midany b, Ismail N. El-Sokkary c, Mohamed El-Hossiny Mahmoud c, Bahaa A. Elkhonezy c, Haytham M. Abdelmoaty b, Mohammed Wael Badawi b, Tamer Hikal c, Mohamed H. Ahmed b, Ahmed A. Khaled d, Mohammed E. ElSaid b, Ibrahim K. Gamil b, Mahmoud khadrawye, Mahmoud Elwakeel f, Eman Mahmoud g, Ahmed H. Lamloom a  
a Department of Cardio-Thoracic Surgery, Faculty of Medicine, Cairo University  
b Department of Cardiovascular & Thoracic Surgery, Ain-Shams University Hospital, Faculty of Medicine, Cairo, Egypt.  
c Department of Cardiovascular & Thoracic Surgery, Faculty of Medicine, Al-Azhar University, Cairo, Egypt.  
d Department of Cardiovascular & Thoracic Surgery, Military Medical Academy, Cairo, Egypt.  
e Department of Cardiovascular & Thoracic Surgery, Nasser Institute, Cairo, Egypt.  
f Department of Anesthesia, Surgical ICU, and Pain Management, Faculty of Medicine, Cairo University, Giza, Egypt.  
g Department of Cardiology, Fayoum University, Fayoum, Egypt.

### Objectives:

Rheumatic heart disease is frequently associated with severe tricuspid valve affection which contributes to worsening heart failure, and decision to repair or replace the tricuspid valve is debatable. Herein, we study the outcome of replacement versus repair in such patients.

### Methods:

A prospective study was conducted on 134 consecutive patients with rheumatic heart disease showing severe tricuspid valve affection who underwent tricuspid valve surgery, between 2015 and 2021. The patients were divided into two groups; TVR (Tricuspid valve replacement) group (n=65) and TVr (Tricuspid valve repair) group (n=69) which included patients who underwent tricuspid valve repair. The valve used for replacement was tissue valve, and for repair a ring was used. Diagnosis and follow up were done by clinical assessment and echocardiography. Preoperative characteristics, clinical outcome, morbidity, mortality, and follow up data were recorded.

### Results:

The mean follow-up period was  $5 \pm 1.62$  years. Most patients (n=70, 52.6%) were presenting in NYHA class III. Tricuspid regurgitation accounted for more than two thirds of cases (n=93, 69.6%). In-hospital mortality was 3 patients (5%) in TVR group and 2 patients (3%) in TVr group (P value = 0.06). Postoperative low

cardiac output syndrome was significantly higher in the repair group [37 (53.2%) vs 26 (41.2%), p value < 0.01]. Postoperative RV dysfunction was significantly higher in TVR group (25 patients, 38.7%) than in TVr group (14 patients, 20.5%), (P value = 0.001). renal impairment, renal failure requiring dialysis [ 3 patients (3.5%) vs 1 patients (1.3%) in TVR and TVr groups respectively] were also significantly higher in the replacement group.

Severe tricuspid regurgitation was reported in 10 patients (14.8%) in the repair group on 5-year follow up, while only 6 patients in the replacement group developed mild to moderate tricuspid regurgitation and no patient had severe regurgitation.

### Conclusion:

Tricuspid valve repair is preferable to replacement to avoid the deleterious effects of prosthesis. However, tricuspid valve replacement shows comparable early and midterm survival outcome. The value of replacement is evident if the rheumatic disease is progressive as indicated by heavy tricuspid valve leaflet involvement.

### Keywords:

rheumatic valve disease, primary tricuspid valve disease, tricuspid valve repair, tricuspid valve replacement, tricuspid regurgitation, heart failure.

# Thymoquinone Dose-Dependently Attenuates Myocardial Injury Induced by Isoproterenol in Rats Via Integrated Modulations of Oxidative Stress, Inflammation, Apoptosis, Autophagy, And Fibrosis

Mahmoud M. Farag<sup>1</sup>, Asmaa A. Khalifa<sup>2</sup>, Wessam F. El-hadidy<sup>1</sup>, Radwa M. Rashad<sup>1</sup>  
<sup>1</sup> Pharmacology and Therapeutics Department, Medical Research Institute, Alexandria University  
<sup>2</sup> Lecturer at Faculty of Pharmacy, Pharos University

## Abstract

As rats develop myocardial infarction (MI) like lesions when injected with large doses of isoproterenol (ISO), this investigation was designed to evaluate the dose-dependent effects of thymoquinone (TQ) on ISO-induced myocardial injury in rats.

## Methods

Adult male rats were divided into negative control, TQ20 (20 mg/kg/day), TQ50 (50 mg/kg/day), ISO positive control, TQ20+ISO, and TQ50+ISO groups. In these rats, biochemical, immune biochemical, and histopathological studies were carried out to evaluate myocardial oxidative stress, inflammation, apoptosis, fibrosis, and autophagy, and the changes in serum cardiac biomarkers.

## Results

The results showed that TQ pretreatment in ISO-administered rats produced a dose-dependent significant reduction of the myocardial infarct size, markedly reduced the ISO-induced elevation in serum cardiac markers and demonstrated several other important findings related to the cardioprotective efficacy of TQ. First, this study is the first reported research work showing that TQ treatment could increase the myocardial reduced glutathione baseline

level, adding an indirect antioxidant effect to its known direct free radical scavenging effect.

Second, pretreatment with TQ significantly reduced the markers of myocardial oxidative stress, inflammation, fibrosis, and apoptosis. Third, TQ acted as an autophagy enhancer ameliorating myocardial cell damage and dysfunction. Thus, the morphological and biochemical changes associated with ISO-induced myocardial injury were ameliorated with TQ pretreatment. The extent of this improvement was significantly greater in the TQ50+ISO group than in the TQ20+ISO group. The present study, for the first time, demonstrates these dose-dependent effects of TQ in experimentally induced myocardial injury. These findings raise the possibility that TQ may serve as a promising prophylactic cardioprotective therapy for patients who are at risk of developing myocardial injury and against the progression of existent myocardial injury as in cases of MI.

## Keywords:

Myocardial infarction · Thymoquinone · Oxidative stress · Inflammation-fibrosis · Apoptosis · Autophagy.

## Ventricular Arrhythmias Following Left Ventricular Assist Device Placement: Can We Predict Them?

Abdelrahman Abdelaal, MBBCh, Ahmed Nafea, MBBCh  
Faculty of Medicine, Alexandria University

### **Aims:**

With the growing number of patients suffering from heart failure worldwide and the short supply of donor hearts for transplantation, left ventricular assist devices (LVAD) remain an option and a well-established treatment for patients with advanced heart failure. One of the main problems facing LVAD, however, is the high prevalence of ventricular arrhythmias after their implantation.

The aim of this review is to:

- Identify the main risk factors of ventricular arrhythmias post LVAD implantation.
- Identify the likelihood of the occurrence of VA in those patients.

### **Methods:**

Literature research was done on PubMed, Web of Science, Cochrane, and Scopus in March 2022. The following combined terms were used: "LVAD" or "left ventricular assist device" or "heart assist device" and "ventricular arrhythmia" or "arrhythmia," "ventricular tachycardia," or "ventricular fibrillation" as either keywords or MeSH terms. Studies were then reviewed for their relevance and non-relevant ones were excluded.

### **Results:**

Thirteen studies were included in this review, The combined odds ratio showed that the greatest predictor of VA post LVAD implantation was VA before implantation. In addition, other independent risk factors included atrial fibrillation before LVAD, the lack of angiotensin converting enzyme inhibitors (ACEI) use after implantation,

idiopathic cardiomyopathy, and heart failure of more than 12 months duration.

Galand et al suggested that early VA less than 30 days after LVAD implantation can be a risk factor of late VA, and Greet et al found that prior cardiac surgery, in particular coronary artery bypass graft surgery, was a risk factors of VA. Rehorn et al found that ventricular tachycardia ablation and the use of antiarrhythmics before LVAD to be a risk factor for the development of late VA.

Enriquez et al uniquely found that perioperative mechanical circulatory support was a risk factor for the development of electrical storm.

Many other predictors were investigated including basic demographics and comorbidities including age, sex, arterial hypertension, dyslipidemia, and even the type of LVAD used, but none were statistically significant to indicate a higher incidence of VA between groups.

### **Conclusions:**

Identifying risk factors of VA before LVAD implantation can guide future indications of implantable cardioverter device (ICD) in patients who did not have it before. Although a large number of patients have ICD by the time of LVAD placement, the placement of ICD before for patient who did not have it before remains an uncertain subject. VA ablation also remains a viable option for many patients before LVAD placement, and to guide the indications for its use, it is important to balance its benefits against risks which have been reported to include the risk of pump thrombosis, although it is worth mentioning that the number of studies suggesting it is scarce.