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SECTION 1: ABSTRACTS PRESENTED @ CARDIOALEX.17

Apolipoprotein B/A-I Ratio in Diabetic Patients with Acute Coronary Syndrome - Importance and Predictive Value

Ayman Helal.MD, Tarek Zaki.MD, Haitham Galal. MD

ABSTRACT

INTRODUCTION: Worldwide, cardiovascular diseases are estimated to be the leading cause of death and disability. Estimation of cardiovascular risk has become the cornerstone of cardiovascular diseases' prevention. Abnormalities in lipoprotein metabolism are one of the key factors but there is almost unanimous agreement among epidemiologists and clinicians that coronary risk assessment based exclusively on low density lipoprotein (LDL) is not optimal particularly in individuals at intermediate risk.

AIM OF WORK: The objective of this study is to study the risk ratio of apolipoprotein B/A-I in type 2 diabetic patients with acute coronary syndrome as compared to such a ratio in type 2 diabetic patients with stable ischemic coronary artery disease and to study the risk ratio of apolipoprotein B/A-I as compared to conventional lipid profile in both groups.

METHOD AND RESULTS: The study was conducted on 50 type 2 diabetic patients who came to the emergency room at Ain Shams University Hospital complaining of ischemic chest pain. The patients were divided into two groups: 25 patients with acute coronary syndrome and 25 patients with stable angina. Complete lipid profile and apolipoprotein B/A-I ratio was estimated within 24 hours of hospitalization for all patients. It was fond that apolipoprotein B, A-I and B/A-I ratio are stronger predictor for acute coronary event than conventional lipid profile with a 60% sensitivity (compared to 48%), 88% specificity (compared to 76%), 83% positive predictive value (compared to 66.667%), 68.7% negative predictive value (compared to 59.375%) and 86.6% accuracy (compared to 62%) at a cutoff point 0.93.

CONCLUSIONS: It was concluded that, apolipoprotein B, A-I and B/A-I ratio are independent significant predictors of acute coronary event and apolipoprotein B/A-I ratio is a stronger predictor for acute coronary event than the conventional lipid profile in type 2 diabetic patients.

KEYWORDS: Apolipoprotein B/A-I ratio, diabetes mellitus, acute coronary syndrome.

Assessment of Left Ventricular Function in Children With Type 1 Diabetes Mellitus Using 2- D Strain Imaging

Hannan Awad[a]; Mohamed Nashat[a]; Ramadan Ghaleb[b]; Ali Abo Hammam[a]

ABSTRACT

OBJECTIVE: Type 1 diabetes mellitus (T1DM) is one of the most common chronic disorders of childhood and adolescence with increasing incidence worldwide. Cardiovascular diseases are the most common cause of death in diabetic patients. There is growing evidence for the assumption that diabetes can lead to systolic and diastolic cardiac dysfunction without other obvious causes for cardiomyopathy.

AIM: This study aimed to Assess subclinical left ventricular (LV) dysfunction in type 1 diabetic children by global longitudinal strain (GLS) using 2 D speckle tracking.

PATIENTS AND METHODS: The study is a prospective clinical study include thirty children with type 1 Diabetes mellitus. A 30 matched age and sex healthy children used as a control group. All subjects in the study subjected to: Full history taking, full clinical examination, routine laboratory investigations (CBC, Hb A1c, Lipid profile) and Echocardiographic study: 2–D conventional Echocardiography and GLS using 2 D speckel tracking.

RESULTS: Comparative analysis between cases and controls regarding LV systolic function in children with type 1 Diabetes Mellitus and matched healthy controls as regard to ejection fraction %, was demonstrated that percentage among cases ranged between 60 and 70 % with a median of
62.5% and among controls it ranged between 62 and 70 % with a median of 65%. The mean EF % was lower in cases (65.1 ± 2.3 %) in comparison with controls (67.9 ± 1.4 %) and this relationship was not statistically significant (p > 0.07).
In the same way, GLS measures among cases ranged (from -22 to - 14%) with a median of -19.5%, though, among controls it ranged (from 22 to -20%) with a median of -21%. Type 1 DM cases had lower mean GLS (-18.8 ± 2.1%) in comparison with controls (-21.1 ± 0.7%). Multivariate regression analysis of the following parameters: haemoglobin level, WBCs count, LDL level, HbA1c level, ejection fraction % and GLS. From the previous parameters, the risk of diabetic cardiomyopathy was significantly correlated to LDL level, HbA1c level and GLS with a p value (0.02, 0.001 and 0.002 respectively).
CONCLUSION: Type 1 DM children have subclinical LV dysfunction despite normal EF. GLS is more sensitive than conventional Echo in detection of early LV dysfunction in children with type 1 DM.
RECOMMENDATION: GLS is a useful diagnostic tool for early prediction of left ventricular affection in type 1 diabetic children.

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Assessment of Left Ventricular Mechanics Before And After Surgical Myectomy in Patients With Hypertrophic Obstructive Cardiomyopathy, Using Two-Dimension Speckle Tracking Echocardiography

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Menofia, Egypt

ABSTRACT

OBJECTIVES: To detect changes in Left ventricular mechanics after surgical myectomy in patient with hypertrophic obstructive cardiomyopathy.

BACKGROUND: Septal myectomy is the gold standard method to relieve LVOT PG in patients with HOCM. Myocardial mechanics are abnormal in those patients, demonstrating low longitudinal strain, high circumferential strain, and high apical rotation compared with healthy subjects. The aim of this study was to determine whether functional improvement after myectomy is associated with improved myocardial mechanics.

METHODS: A total of 15 patients (60% males and 40% female)**.** with HOCM refractory to medical treatment were subjected to septal myectomy, Clinical data and paired echocardiographic studies before and within 6monthes after myectomy were analyzed and compared. Myocardial mechanics including longitudinal and circumferential strain and rotation and LV synchronization were assessed using two-dimensional strain software (Velocity Vector Imaging).

RESULTS: Significant symptomatic relieve, left ventricular outflow gradient decreased dramatically (from 63.13 ± 10.25 to 9.96 ± 2.72mmHg; P < .0001), and left atrial volume index decreased (from 37.8 ± 5.61 to 26.38 ± 3.37 cm3/m2; P < .05). E/e´ decreased from (15.23 ± 2.39 to 9.18 ± 1.42; P < 0.05), Low longitudinal strain decreased at the myectomy site (basal septum), increased in the basal inferior segment, and remained unchanged globally (-6.43 ± 6.54 to -8.70 ± 2.30; P 0.232). High circumferential strain decreased (from -28.47± 3.35 to -18.26 ± 2.86, P < .05). High left ventricular twist normalized (from 16.52 ± 2.25 to 14.02 ± 2.27, P < .05).

CONCLUSION: Surgical myectomy alleviated symptoms, relieved obstruction, and decreased left atrial volume index. Longitudinal strain remained unchanged, but circumferential strain and rotation decreased, demonstrating different mechanical adaptations to chronic elevated afterload seen in patients with severe aortic stenosis undergoing valve replacement, Improvement of the predictors of diastolic function seem to be related to symptomatic response to myectomy.

KEY WORDS: Hypertrophic obstructive cardiomyopathy (HOCM), Left ventricular outflow tract obstruction (LVOTO), Septal myectomy, Speckle tracking.

Perspective of PA-RV Connection: Past, Present, Future

Hamdy Singab

ABSTRACT

BACKGROUND: However, the evolution of different right ventricle to pulmonary artery reconstructive techniques and conduits, the best possible surgical strategy is yet to be developed.

Despite Valved conduits was trying to imitating the native right ventricular outflow RVOT, they failed grow and the trend of reoperation is inevitable. [1]

However, the valve less options PA-RV connection had a very high risk especially in the presence of elevated pulmonary artery pressures, several studies have shown the long durability and freedom of reoperation of PA-RV conduit (homgraft – conegra) especially in neonate, infant and childhood. [2&3]

Because of limited availability of the homografts in our country due to religious, socioeconomic and absence of law regulating organ donation the allerternative heterograft especially in the small sizes had a big chance for using. Contegra was introduce commercially now and become available [4].

AIM OF THE WORK: Our study was done to assess these techniques for PA-RV connection and recent updates of their surgical alternatives Conduit focusing on their suitability for variable age as well as different pathology.

PATIENTS & METHODS: After the approval of the ethical committee in our institute ain shams university hospital and obtaining an informed consent from the patient's family relatives (father & mother), a total number of 11 patients of both sexes undergoing PA-RV conduit surgery using contegra (nonstented& stented) had an either variety of RV - PA pathological Discontinuity or a high risk physiological limiting factor in the duration from march 2014 to june 2016. 2 infant fallot abscent pulmonary valve (18%), 4 infant TOF – multiple MAPCAS with good sizes pulmonary arterys (43%), - 3infant TGA – VSD – PS (21%), 1infant MGV –VSD – POSTbanding (9%), 1 adult had severed PR post fallot repair (9%). Postoperarive we had only 1 cases mortality (9%). 2 case (18%) prolonged mechanical ventilation due to acquired nosocoumial pneumonia. All our patient had significant reduce the postoperative period of ventilation as well as the need of inotropic support.

CONCULSION: The right ventricular outflow tract abnormality respsented the main pathological core issue in a respected propotion of congenital heart defects. The surgical strategy RVOT reconstruction vary by age group.however, in neonates and l infants the use of RV-to-PA conduits is the ideal option,Contegra is the most widely used conduits to restore PA-RV connection.

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Regional Myocardial Function in Patients With Coronary Artery Disease Before And After Coronary Intervention By Tissue Doppler Study

Abdelaziz Mohamad Gomaa .MD

ABSTRACT

BACKGROUND: Percutaneous coronary intervention (PCI) is an established procedure for the treatment of coronary artery disease. Its usefulness in symptom relief is well established.However, the effect of PCI on systolic and diastolic function in patients with preserved baseline left ventricular systolic function is unknown.Recently, tissue Doppler echocardiography as emerged as a sensitive and quantitative measure of both systolic and diastolic longitudinal myocardial function.Furthermore, it has been reported that impaired left ventricular longitudinal function may precede circumferential ventricular dysfunction in patients with coronary artery disease.We hypothesized that although not evident on standard 2-dimensional echocardiography or contrast ventriculography, reduced regional contractile function distal to coronary artery stenosis may be present in patients with chronic stable angina and that PCI would have the potential to improve ventricular systolic and diastolic function after successful angioplasty .To test this hypothesis, we used tissue Doppler parameters known to sensitively detect systolic and diastolic dysfunction. Measurements were taken before, immediately after, and 6 weeks after PCI to assess whether early effects due to improved perfusion, if present, would persist over time.

AIM OF THE WORK: To determine the impact of percutaneous coronary intervention (PCI) on myocardial function assessed by tissue Doppler Echocardiography in patient with coronary artery disease.

PATIENTS METHODS: This study included (40) subjects who were classified into two groups:Patients group: This group included 30 patients with ischemic heart disease (stable angina) who underwent elective PCI. These patients included 19 male (63 %) and 11 female (37%) with ages ranged from 42 to 65 years with mean age of 54.7 ± 6.1 years.Control group: This group included 10 apparently healthy subjects (4 males and 6 females) "40 % and 60 % respectively ", ranging in age from 47 to 65 years old with a mean of 54.2± 6.3 years with normal findings on the resting ECG , at Echocardiography and normal coronary angiography which was done to evaluate their chest pain with equivocal results of stress test..Then we grouped the patients according to the vessel upon which the stent is implanted into 3 subgroups, Subgroup (1) : The patients who performed PCI to LAD . Subgroup (2): The patients who performed PCI to LCX. Subgroup (3): The patients who performed PCI to RCA. Ventricular diastolic function (Transmitral&Transtricuspid Doppler Velocities) assessed by conventional Echocardiography done for patients 1 day Before, 1day & 6 weeks after PCI as a pulsed-wave Doppler mitral and tricuspid inflow velocities, including E, A and E deceleration time wave peak velocities (in centimeters per second). Tissue Doppler evaluation of systolic & diastolic function for control group and for patients group 1 day before and 1 day after PCI, and 6 weeks after PCI:Systolic velocity (Sm) , Early diastolic velocity (Em), Late diastolic velocity (Am) .They were measured with the sample volume positioned at the septal, lateral, inferior, and anterior angles of the mitral annular ring. It also positioned on the lateral angle of the tricuspid valve to assess the right ventricular function.

RESULTS: As regards to subgroup (1): Our study showed that as regard to systolic function, early diastolic, late diastolic function the PTD Echocardiographic variables revealed significant difference in Sm, Em & Am between patients 1 day before and 1day, 6 weeks after PCI to LAD in which we found significant improvement in the septal & anterior walls. However we found that the inferior , lateral & right walls showed non-significant improvement as regards Sm , Em & Am between patients 1 day before and 1day , 6 weeks after PCI to LAD.-As regards to subgroup (2):Our study showed that as regard to systolic function , early diastolic , late diastolic function the PTD Echocardiographic variables revealed significant difference in Sm , Em & Am between patients 1 day before and 1day , 6 weeks after PCI to LCX in which we found significant improvement in the lateral wall. However we found that the inferior , anterior , septal & right walls showed non-significant improvement as regards Sm , Em & Am between patients 1 day before and 1day , 6 weeks after PCI to LCX.-As regards to subgroup (3):Our study showed that as regard to systolic function , early diastolic , late diastolic function the PTD Echocardiographic variables revealed significant difference in Sm , Em & Am between patients 1 day before and 1day , 6 weeks after PCI to RCA in which we found significant improvement in the inferior&right walls. However, we found that the lateral, septal & anterior walls showed nonsignificant improvement as regards Sm, Em & Am between patients 1 day before and 1day, 6 weeks after PCI to RCA.

CONCLUSION: Tissue Doppler echocardiography is a noninvasive and widely available diagnostic technique that allows the sensitive detection of myocardial dysfunction.Our work clarifies its potential in detecting the effect of successful angioplasty on myocardial function.Myocardial function improved within hours after intervention, even in the absence of evident baseline systolic dysfunction, potentially reflecting the presence of hibernating myocardium.The potential of tissue Doppler–derived parameters in ascertaining the acute and long-term success of myocardial revascularization merits further study.

KEY WORDS: PTD (Pulsed Tissue Doppler), TDI (tissue doppler imaging), LAD (left anterior descending artery), LCX (lateral circumflex artery), RCA (right coronary artery), PCI (percutanous coronary intervention).

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Relation Between High Sensitivity C-Reactive Protein And Thromboembolic Risk Markers Assessed By Echocardiography In Patients With Nonvalvular Atrial Fibrillation

Abdelhakeem Selem MD, Ahmed Shawky MD, Ahmed Shaker MD

ABSTRACT

INTRODUCTION: There is strong association between inflammation and atrial fibrillation (AF), as high- levels of high-sensitivity C-reactive protein(hs-CRP) have been noted to be higher among patients with AF. AF promotes thromboembolism through a variety of mechanisms, blood stasis, endothelial dysfunction and inflammation.

OBJECTIVES: This study aimed to assess the relationship between hs-CRP as inflammatory marker and the risk of thromboembolism in patients with non valvular AF.

METHODS: This study included 100 patients with non valvular AF referred to transesophageal echocardiography(TEE) before cardioversion or in patients with stroke to evaluate thromboembolic markers (LAA thrombus, LAA low flow velocity, SEC),transthoracic echocardiography(TTE) to measure LA anteroposterior diameter (AP),LA area, and LV EF and hs-CRP blood level .The patients divided into two groups Group (A) included 26 patients with hs-CRP ≥4.5 mg/dl Group (B) included 74 patients with hs-CRP<4.5mg/dl.

RESULTS: Group (A) patients were significantly older (p = 0.003), have longer duration of AF (P=0.003), higher left atrial size (LA AP diameter. &LA area P<0.001), lower LVEF (50.923 ±8.291 % vs 57.054±7.83 % P =0.021), higher incidence of thromboembolic markers as LAA thrombus (76.9% vs 18.92% p< 0.001), dense SEC (53.84% vs 18.92% p< 0.001) and LAA low flow velocity (17.058± 2.751 vs 26.986± 9.083, p < 0.001) and higher CHADSVASc score (4.692 ±1.032 vs 1.838 ± 1.118, p <0.001) compared to group (B). Hs-CRP showed significant positive correlation with age (r=0.514, p < 0.001), CHADSVASc (r=0.603, p < 0.001), LA diameter (r=0.628 p < 0.001), LA area (r = 0.525, p < 0.001), SEC (r=0.603 p < 0.001), LAA thrombus (r = 8.313, p < 0.001) and AF duration (r =2.877, p= 0.006) and significant negative correlation with LAA emptying velocity (r =-0.530, p <0.001), filling velocity (r = -0.487, p < 0.001), and LVEF (r =-0.317, p =0.025). The cut-off value of hs-CRP >4.5 mg/ dl had sensitivity, specificity, positive & negative predictive values and accuracy 95 %, 90.3% ,92.9, 97 and 93% respectively for predicting thromboembolic risk in patients with non valvular AF.

CONCLUSION: High-sensitivity C- reactive protein (hs-CRP) level is suitable to predict thromboembolic markers in patients with non-valvular AF. Therefore, it can help to predict the presence of these markers among AF patients in combination with established clinical risk score (CHA2DS2-VASc score).

KEY WORDS: Thromboembolic risk, hs-CRP, non valvular atrial fibrillation

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When Is It Necessary To Resend A Residual Shunt To A Surgeon?

Khaled Samir Mohamed, MD, FETCS

ABSTRACT

OBJECTIVES: Evaluation of the real volume and outcome of the problem of residual shunts after congenital heart surgery. **METHODS:** Between June 2009 and June 2015 the author operated 451 patients who needed a closure of shunting lesion and were living after 1 month postoperative; 203 males, 248 females with an age median 34 months ± 2.8. Diagnosis: TOF (all forms)
154, VSD 151, AVSD 42, DORV 36, ASD 29, PDA 28, TGA 8,
A-P window 3. All patients had median sternotomy except for 7.
All patients had CPB without cooling and cold crystalloid blood enriched ante grade cardioplegia.

RESULTS: Median cross clamp time 21.8 minutes, cardiopulmonary bypass time 43.6 minutes, ICU stay 2.6 days and hospital stay 8.2 days.Only one patient had a sudden deterioration on the 6th postoperative day just before being discharged; echo showed detachment of a part of the patch that was not seen in the earlier echo. Follow up duration median was 25 months ± 2.8. A residual shunt was detected in the pre discharge echo of 129 patients (28.6%) they were called group II; 16 at the atrial level (12.4%), 105 at the ventricular level (81.4%) and 8 at both levels (6.2 %). The number of shunts ≤ 2mm we called type A was 92 (71.3%), 34 (26.4%)>2mm and ≤ 4mm; type B and 3 residuals > 4 mm (3.1%); type C. At 3 months postoperative 390 patients (86.5%) had echo.
117 of Group II patients (90.7%) had echo and only 109 patients were still showing residuals 74 of type A (67.9%), 32 type B (29.4%), 3 type C (2.8%).
Spontaneous closure in 8 patients out of 117 examined patients (6.8%) were all of type A. Only one patient needed reoperation 7 months after the operation.

CONCLUSION: Tiny residuals may close spontaneously. Medium and large residual shunts are associated with longer clamping and CPB time as well as ICU and hospital stay.
Only shunts larger than 4mm may need intervention. Shunts less than 4 mm needs more patient reassurance than treatment. Residual shunts should be mentioned in the operative consent

INTRODUCTION

Residual is a term that usually represents the persistent of a part of a lesion or a development of a new lesion. Residuals presents a very important issue in pediatric cardiac surgery both from the clinical outcome and medicolegal point of view.
The most common types of residuals are: 1. Residual shunts.
2.Residual gradients. 3.Residual lesions as tumors, abscess…. etc
The evaluation of the residual and its effect as well as the need and ways of management is a point of controversy. [1]
Residual shunts result from incomplete closure of an original shunt or creation of a new shunt. Residual shunts size is usually over estimated due to earlier under estimation of the original shunt and defective measurement of the shunt surface area in relation to the defect size. Causes of residual shunts can vary between Imperfect estimation of the defect as regard the size or multiplicity, Imperfect defect closure, Slipped or broken suture, muscle tear, over dissection or excision, ischemia or sometimes it can be left on purpose.
The objective of our study is the evaluation of the real volume and outcome of the problem of residual shunts after congenital heart surgery.

PATIENTS AND METHODS

Between June 2009 and June 2015 the author operated 451 patients who had a repair that included a need for a closure of shunting lesion and were living after 1 month postoperative. Age median 34 months ± 2.8 and the body weight median was 12.1 + 2.3 kg. there were 203 males and 248 females.
The diagnosis was Tetralogy of Fallot (all forms) in 154 patients,
VSD in 151, atrioventricular septal defect (AVSD) in 42, double outlet right ventricle in 36, ASD in 29, PDA in 28, TGA (who had atria with the technique of Senning) in 8, aorto pulmonary window in 3. All patients had median sternotomy except for 7 patients who had right posterior mimithoracotomy for ASD closure.

All patients had CPB with no cooling. Cold crystalloid blood enriched ante grade homemade cardioplegia was used in all patients. We used Dacron patches for VSD closure while ASD, AVSD, P-A window was closed by pericardium either fresh or Glutaraldehyde fixed and PDA ligation by silk suture. Non absorbable 5/0 monofilament for suturing. Resection was used only for fibrous tissues and interruption for muscle bands. Us aim is always to keep aortic clamping time at minimum.

Follow up was made by the use of echocardiography with the following milestones: before the patient is discharged from the hospital, every 3 months twice then every year after.

A hemodynamic study by catheter was used to estimate residual shunt associated with hemodynamically significant stenosis.

One hundred forty-seven patients were incompliant to follow up (32.6%). The median cross clamp time 21.8 $\pm$ 4.7 minutes, the median cardiopulmonary bypass time 43.6 $\pm$ 8.1 minutes, the median ICU stay 2.6 $\pm$ 1.9 days, the median hospital stays 8.2 $\pm$ Th days. Only one patient had a sudden deterioration on the 6 postoperative day just before being discharged; echo showed detachment of a part of the patch that was not seen in the earlier echo. Follow up duration median was 25 months $\pm$ 2.8. A residual shunt was detected in the pre discharge echo of 129 patients (28.6%) they were called group II. Of those residual shunts there were16 at the atrial level (12.4%), 105 at the ventricular level (81.4%) and 8 at both the atrial and ventricular levels (6.2 %).

The distribution in relation to the diagnosis is listed in the table 1.

The number of shunts $\leq$ 2mm we called type A was 92 (71.3%), 34 (26.4%)>2mm and $\leq$ 4mm; type B and 3 residuals > 4 mm (3.1%); type C. Group II and its sub groups A, B and C characteristics are listed on the table 2.

At 3 months postoperative 390 patients (86.5%) had echo.

117 of Group II patients (90.7%) had echo and only 109 patients were still showing residuals 74 of type A (67.9%), 32 type B (29.4%), 3 type C (2.8%).

Spontaneous closure in 8 patients out of 117 examined patients (6.8%) were all of type A. Only one patient needed reoperation 7 months after the operation.

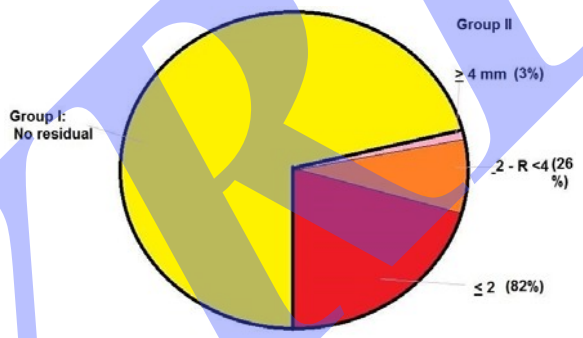

Fig 1: distribution of patients' population.

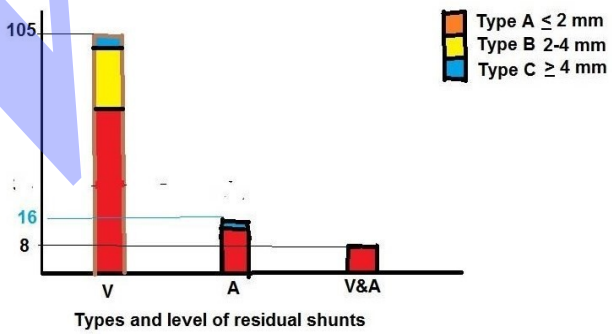

Fig 2: Types and levels of the residuals

AVSD repairs was associated with highest rate of residuals (45%) while TOF repair had the highest rate of moderate size residuals of group II b (29%) and DORV repair had the highest rate of large residuals of group II c (11%). Table 2 shows that aortic cross clamping time was higher in Group II and special in the sub groups b with P value 0.036 and c with a P value 0.029.

The same remark was found with CPB time with statistically significant risk in II b (P = 0.048) and II c P = 0.031).

The hospital stay duration median calculation proved that being in group II c is a statistically significant risk factor with a P value of 0.019.

	TOF	VSD	AVSD	DORV	ASD	PDA	TGA	A-P window
No.	154	151	42	36	29	28	8	3
residuals	38	41	19	9	7	3	4	0
≤ 2 mm	26	37	15	6	4	2	3	
2 - < 4	11	12	4	2	3	1	1	
4 ≤	1		1	1				

Table 1: residual and its sizes shunts per diagnosis

DISCUSSION

Residual shunts can be a nightmare for each pediatric cardiac surgeon due to ethical, medicolegal and financial causes. Small residual shunts can be very noisy and cause a great psychological problem to the patient especially if he or she was provocated by any misleading information by any medical personnel. Large defects can be catastrophic causing severe hemodynamic disturbance and may need urgent management by percutaneous intervention or reoperation. Echocardiographic examination has a tendency for over estimation of the size of residual shunts specially if the surface area of the residual

	Group I	Group II	II A	II B	II C
No.	322	129	92	34	3
CXT	20.9	23.2	22.1	27.3	29.1
CPB	38.2	45	44.6	62.1	66.9
ICU	2.4	3.2	2.5	4.1	4.7
Hosp	8.6	9.1	7.4	8.5	16.3
Reop	0	0	0	0	1

Table 2: statistics of Group I (no residuals) and II (residuals) with its sub groups A (< 2 mm), B (2 - < 4 mm) and C (4 < mm), dark cells = P < 0.05 (significant)

Shunt column or neck is not calculated. If there was no mention of the possibility of such a complication to the patient and in the preoperative consent a residual shunt can result in serious medicolegal problems. Financially the increased cost due to longer ICU, hospital stay and medications raises another issue and this will be a real problem in case of a need for reintervention; usually the insurance authority is reluctant to pay without investigations. The psychological effect on the patient varies according to the patient personality and the family reaction, some psychological effects can be long term or life time up to the need for continuous psychiatric treatment.

Endocarditis and its prevention remains an issue especially in case of small residuals. Hemolysis is another problem that can be seen with small residual shunts and up to a life threatening condition.
Dodge and colleagues concluded in their study that up to 1 third of residual VSDs < 2 mm may close spontaneously within a year and that has suggested that nonsignificant residuals should be left alone. [1]
Preoperative preparation of the patient and the choice of the suture type and technique can help in residual avoidance. Proper intraoperative assessment of the shunt closure should be the role and immediate closure of any significant shunt should be done. [2,3,4] There is a consensus among all authors that the management of residual shunts depends on the hemodynamic effects above all. Slightly significant residuals are treated medically (diuretics – vasodilators) or by percutaneous intervention. Residuals with significant hemodynamic effect might need urgent management by catheter or surgery. A residual shunt is a nightmare for interventional cardiologists too as with expansion of percutaneous closure higher numbers of residual shunt are seen. [5,6]
The higher clamping time in groups II b and c means that residual shunts are more common with complex lesions and more difficult ones. From all the above we can see that minimizing the risk of having residual shunt associated problems starts with preoperative patient preparation and awareness, intraoperative proper exposure and closure with transesophageal echo monitoring and postoperative proper communication and early management.
Conclusion
Tiny residual shunts may close spontaneously. Residual shunts are serious problems no matter how small they are and should be avoided by all means. Medium and large sized residual shunts are associated with longer clamping and CPB time as well as ICU and hospital stay. Only shunts larger than 4mm may need intervention. Shunts less than 4 mm needs more patient reassurance than treatment.
Residual shunts should be mentioned in the operative consent. Ethically and legally a doctor should notify the referring doctor and not the patient.

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Reversal of Abnormal Cardiac Parameters Following Mitral Valve Replacement For Severe Mitral Stenosis in Relation To Pulmonary Artery Pressure

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ABSTRACT

HYPOTHESIS: Pulmonary hypertension (PAH) with mitral stenosis (MS), though regresses after surgery, can persist to a variable extent and frequency, which can be influenced by several factors and this is not adequately appraised. The study aims to compare the preoperative and postoperative clinical and hemodynamic variables in patients who attained normal, near-normal PAP and persistent-PAH one-year after MVR, thereby elucidating factors related to persistent-PAH.

METHODS: 50 patients with MS-PAH (varying grades) were classed based on their one-year post-surgical PAP: I- normalized (30-35mmHg), II- near-normal (35-40mmHg), and III- residual-PAH (>40mmHg); and compared for their demographics, preoperative and postoperative clinical & hemodynamic variables-PAP, Tricuspid regurgitation(TR), cardiac enlargement; and their regression. Their significance was statistically analysed.

RESULTS: Gp-I had 19 patients, Gp-II 14, Gp-III 17. Though their demographics did not differ much, the duration was longer in Gp-III. Hemodynamically, the stenosis-severity and rhythm did not affect the groups. Other factors associating with the severity of disease in Gp-III included a higher functional class {III: IV (17:2, 12:2, 9:8; $p < 0.05$)}, higher PAP which was most striking (mean 51.32 vs 61.21 vs 84.35 mmHg respectively; $p<0.01$), (80% severe-PAH(>60mmHg), 6 suprasystemic-pressures), greater degree of cardiomegaly and TR-severity ($p < 0.05$). A greater right-ventricular(RV) dilatation with persistence postop (<p 0.05), and greater no of patients in Class-III postop accompanied the persistent-PAH (despite considerable degree of regression), compared to other groups. Preoperative-PAP, pre & postop- right-atrial(RA), RV size, and TR, showed significance on further analysis.

CONCLUSION: A higher preoperative-PAP and grade, RV dilatation and TR, indicating the severity of the disease, are most important factors that influence the postoperative hemodynamics and course after MVR regardless of other factors.

KEY WORDS: Mitral Stenosis, Pulmonary Artery Pressure, Mitral Valve Replacement

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XANTUS-EL: A Real-World, Prospective, Observational Study of Patients Treated With Rivaroxaban For Stroke Prevention In Atrial Fibrillation In Eastern Europe, Middle East, Africa And Latin America

Alexander GG Turpie, Carlos Arturo Areán Martínez, Fernando Lanas, Ghazi Radaideh and Suleiman M Kharabsheh, on behalf of the XANTUS Investigators

ABSTRACT

AIMS: The real-world, international, prospective, observational XANTUS study demonstrated low rates of stroke and major bleeding in an unselected atrial fibrillation (AF) patient population treated with rivaroxaban in routine clinical practice in Europe, Canada and Israel. XANTUS-EL is a sister study to XANTUS with the aim to investigate the safety and effectiveness of rivaroxaban in routine clinical use in patients with AF in Eastern Europe, Middle East, Africa and Latin America.

METHODS AND RESULTS: XANTUS-EL was a prospective, observational study of unselected patients with non-valvular AF newly starting rivaroxaban for stroke prevention. Patients were followed for 1 year, at ~3-month intervals, or for ≥30 days after permanent discontinuation. Primary outcomes were major bleeding, adverse events (AEs) or serious AEs (SAEs) and allcause mortality. Secondary outcomes included symptomatic thromboembolic events and non-major bleeding. All events were collected as AEs or SAEs. Major outcomes were adjudicated by a central committee. 2064 patients were enrolled from January 2013 to January 2016. 80.3% received rivaroxaban 20 mg once daily (od) and 18.9% received 15 mg od; 59.2% had prior anticoagulation therapy. Mean age was 67.1 (11.32) years (≥75 years: 28.2%); first available weight was 82.9 (17.06) kg; 49.3% were male; 57.4% had first available CrCl of ≥50 mL/min (missing values: 29.8%); 14.1% had newly diagnosed AF, 33.8% paroxysmal AF, 14.5% persistent AF and 37.4% permanent AF. Co-morbidities included congestive heart failure (30.9%), hypertension (84.2%), diabetes mellitus (26.5%), prior stroke/non-CNS systemic embolism (SE)/transient ischaemic attack (TIA; 16.2%) and prior myocardial infarction (MI; 10.7%). Mean $CHADS_2$ and CHA_2DS_2-VASc scores were 2.0 and 3.6, respectively; mean HAS-BLED score was 1.6. Rates of treatment-emergent major outcomes were as follows (events/100 patient-years, [95% CI]): major bleeding 0.9 (0.5–1.4) (fatal 0.1 [0.0–0.3]; intracranial 0.16 [0.03–0.46]); all-cause mortality 1.7 (1.2–2.4); stroke/non-CNS SE 0.7 (0.4–1.2); stroke 0.6 (0.3–1.1); non-CNS SE 0.1 (0.0– 0.3); TIA 0.3 (0.1–0.6); MI 0.3 (0.1–0.7); and any AE 18.1 (16.2–20.1) and SAE 8.3 (7.0–9.7). Incidence of haemorrhagic and ischaemic stroke was 0.05% and 0.5%, respectively. Treatment persistence was 81.9%.

CONCLUSIONS: In the XANTUS-EL real-world, prospective, observational study of rivaroxaban in patients with AF in Eastern Europe, Middle East, Africa and Latin America, rates of stroke/non-CNS SE and major bleeding were low. This patient population was younger than that in XANTUS, but with a similar baseline risk of stroke. Ischaemic stroke rates were similar to those in XANTUS and major bleeding rates were lower.

CHARACTER COUNT: 2752/3500 (including spaces)

Department of Medicine, McMaster University, Hamilton, ON, Canada

SECTION 2: RESUMES, ARTICLES AND TOPICS PRESENTED @ CARDIOALEX.17

Atrial Fibrillation in Cardiac Resynchronization Therapy

Mohammad Shenasa, MD, PhD

It is now well known that left bundle branch block (LBBB) produces electrical and mechanical dyssynchrony and poses a significant risk on morbidity and mortality such as worsening of heart failure (HF) symptoms, atrial fibrillation (AF), ventricular arrhythmias, and sudden cardiac death.

The benefit of cardiac resynchronization therapy (CRT) in patients with HF and left ventricular (LV) systolic dysfunction is also well established. It has also been described that CRT improves both electrical and mechanical synchrony in patients with LBBB and HF.

However, about 25-30% of patients with HF and LBBB who receive CRT per guideline indications (LVEF < 35%, QRS duration ≥150 msec, NYHA class II and III, and ambulatory class IV) do not respond to CRT and are considered 'non-responders'.
AF and HF often coexist and share many risk factors and comorbidities. Indeed, they promote each other, i.e. HF begets AF and AF begets HF. AF in patients with CRT poses several deleterious effects such as worsening of HF, lack of 100% biventricular pacing, and the need for antiarrhythmics and anticoagulation, which by itself increases the risk of proarrhythmia and thromboembolic complications, respectively. There are several options in the management of AF in patients with CRT such as;

1. Pharmacological management
2. Rate control strategy: Using atrioventricular (A-V) nodal block agents such as calcium antagonists, beta-blockers, amiodarone, digoxin (?), etc.
3. Rhythm control strategy: Using antiarrhythmics such as Sotalol, amiodarone
4. Non-pharmacological strategy: A-V nodal ablation and CRT implant
5. Catheter ablation of AF
6. Atrial defibrillators
   Often, hybrid management may be required.

In this lecture, we will review the importance of AF in patients with CRT and provide methods to decrease the AF burden in this patient cohort and methods to decrease morbidity and mortality in these patients. The current trials on atrioventricular nodal and AF ablation as well as the guidelines will also be discussed.

Cardiac Resynchronization Therapy in Patients with Right Bundle Branch Block, Narrow QRS, and Mild Heart Failure

Mohammad Shenasa, MD, PhD

The efficacy of cardiac resynchronization therapy (CRT) in patients with moderate to severe heart failure (HF), severe left ventricular (LV) dysfunction and complete left bundle branch block (LBBB) is well established and has evidence and guideline support (LVEF < 35%, QRS duration ≥150 msec, NYHA class II and III, and ambulatory class IV).

However, the benefit of CRT in patients with right bundle branch block (RBBB), narrow QRS, and mild HF is less established and remains controversial. In this lecture we discuss the benefit of CRT in these three groups.

1. CRT in patients with RBBB: In general, RBBB poses less negative impact on electrical and mechanical function of the cardiac physiology. Several studies demonstrate that compared to LBBB, incident RBBB poses less detrimental effect on morbidity and mortality. RBBB mostly affects the RV activation and mechanics. RBBB may also cause some degree of dyssynchrony by altering the normal activation sequence. Although the effect of CRT patients with RBBB is less investigated, the current data and guidelines do not suppose the use of CRT in patients with RBBB and heart failure HF and indeed have a negative impact.
2. CRT in patients with a narrow QRS or QRS duration of <130 and those with non-specific intraventricular conduction delay: The current data from multiple trials does not support CRT implantation in patients with a narrow QRS complex. Indeed, patients with a narrow QRS do worse with CRT than those without, and a QRS duration of ≥140 msec is preferable to 150 msec, which is only a predictor of benefit of CRT. However, there may be some patients with electrical dyssynchrony and mechanical dyssynchrony (RESPOND Study). The effect of CRT in patients with LBBB and HF with preserved LV function (HFpEF) is not well delineated. This is, in part, due to our lack of understanding of the pathophysiology of HFpEF.
3. CRT in patients with mild HF: CRT may benefit some patients with mild HF due to preventing remodeling in the early stages. However, large randomized data is lacking.
4. Effect of CRT on mitral regurgitation (MR): Functional MR is an important consequence and deleterious effect of HF with reduced LV function, probably due to LV dilatation, lack of coordinated contraction, and mitral valve co-optation. Thus, it is conceivable that CRT improves the degree of MR.

In summary, CRT improves LV systolic function in patients with LBBB, especially those with a QRS duration of greater than 140-150 msec. However, it is not improved in patients with a narrow QRS or RBBB.

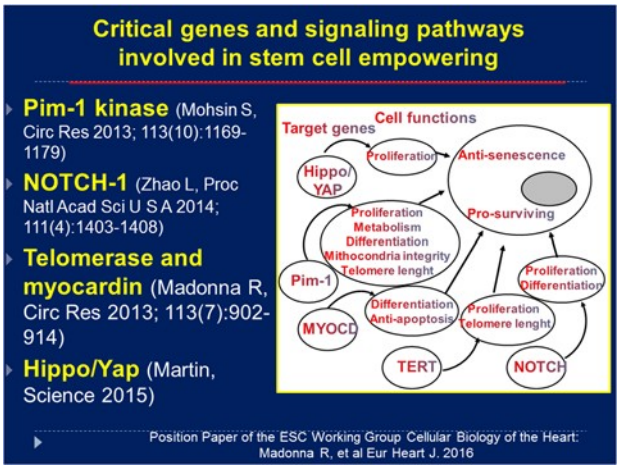
CRT in patients with mild HF may prevent remodelling; however, large randomized data is lacking. Part of the problem is probably due to the fact that electrical and mechanical dyssynchrony may be discordant. Further investigation is warranted to better understand the mechanism of this issue.

Cardiovascular Stem Cells and Regenerative Medicine

Rosalinda Madonna, MD, PhD

Center of Excellence on Aging, Institute of Cardiology, Department of Neuroscience and Imaging, "G. d'Annunzio" University, Chieti, Italy; Heart Failure Research, Texas Heart Institute, Houston, Texas; Department of Internal Medicine, Cardiology, The University of Texas Health Science Center at Houston, Houston, Texas; rmadonna@unich.it

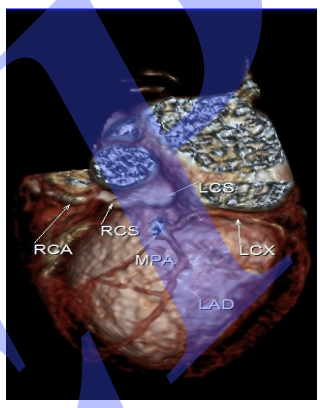
Despite improvements in modern cardiovascular therapy, the morbidity and mortality of ischemic heart disease (IHD) and heart failure (HF) remain significant in Europe and worldwide. Patients with IHD may benefit from therapies that would accelerate natural processes of postnatal collateral vessel formation and/or muscle regeneration. In this lecture, we discuss the use of cells in the context of heart repair, and the most relevant results and current limitations from clinical trials using cell-based therapies to treat IHD and HF. The lecture will undertake a critical appraisal of where the stem cell field stands and where it appears to be headed, by critically reviewing the current approaches using stem cell or cell-based therapies to treat IHD and HF. New strategies for stem cell therapy enhancement, which include *ex vivo* cell-mediated gene therapy, aimed at increasing the efficacy and outcome of stem cell therapies in the future, will be also discussed.



Clinical CT Cases

Heba Kamal Weshahy, Pediatric Cardiologist at National Heart Institute

1- Dilated cariomyopathy in four year old girl:

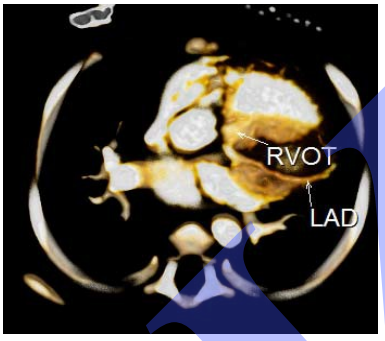


Clinical picture: 4years old female, presented by dysnea, respiratory distress, cardiomegaly and gallop.
Echocardiography: dilated cardiomyopathy, dilated left ventricle with impaired contractility EF 20%, FS 10%.

CT angiography

- Absent left main coronary artery.
- Anomalous origin of the LCX and LAD by separate ostia from the left side of the main pulmonary artery.
- Diffuse dilatation of the RCA.
- Many dilated intercoronary collaterals.

Conclusion: picture of adult type of ALCAPA.

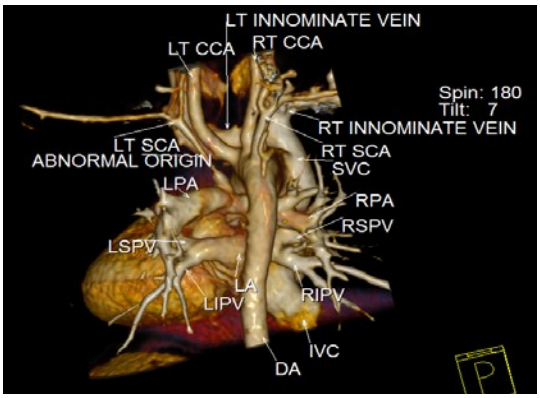


2- (Dilated cardiomyopathy in 10 month girl):

Clinical picture: 10 months old female, presented by dysnea, recurrent pneumonia, respiratory distress, cardiomegaly and gallop.
Echocardiography: dilated left ventricle with impaired contractility EF 22%, FS 10%, suspected ALCAPA.

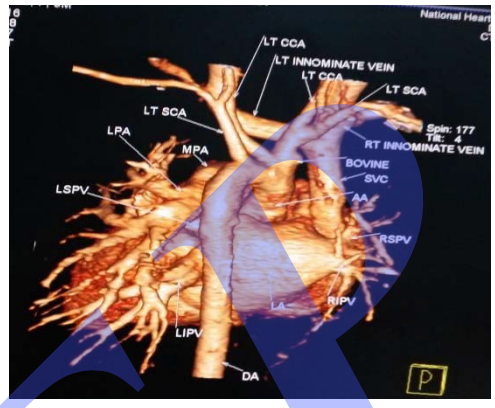
CT angiography:
Anomalous origin of the LAD from the left side of the main pulmonary artery.
The left circumflex arises from the left coronary sinus of Valsalva and runs its normal course.
Mild diffuse dilatation of the RCA.
Conclusion: picture of ALCAPA.

3- (ASD with severe pulmonary hypertension):



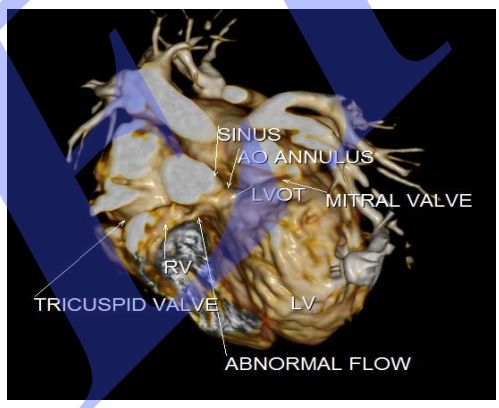
Clinical picture: 9 months old female presenting by recurrent pneumonia, feeding difficulties, poor weight gain, cardiomegaly and accentuated S2.
Echocardiography: dilated RV, severe TR, moderate sized secundum ASD and severe pulmonary hypertension.
CT angiography:
Average sized main pulmonary artery continuous with its left branch.Absent right pulmonary artery.
An indirect MAPCA supplying the right lung.
Diminished right lung volume with minimal pleural effusion.

4-(tetralogy of Fallot with upper limb weakness):



Clinical picture: 20 months old female, presented by dysnea, cyanosis, weakness of the left upper limb, right ventricular enlargement and systolic murmur.
Echocardiography: TOF with good size of pulmonary arteries.
CT angiography:
Average sized confluent main pulmonary artery and its both branches, McGoo's ratio 2.2/1.
Bifurcational stenosis of the left and right pulmonary arteries.
Abnormal origin of the left subclavian artery from the left pulmonary artery.
Right sided aortic arch with mirror image branches.

5-(Postoperative Residual VSD):



Clinical picture: 18 months old female, presented (6 months following surgical closure of VSD and epicardial pacemaker insertion) by dysnea, respiratory distress, pansystolic murmur.
Echocardiography: abnormal flow directed from the aorta to the RV, suspected ruptured sinus of Valsalva.
CT angiography :
Residual VSD between the LVOT and RV cavity just below the Tricuspid valve, with normal aortic annulus, coronary sinuses of Valsalva and coronary arteries.
Mild proximal stenosis of the left pulmonary artery.

Complicated Silently

Waleed Waheed Etman, Cardiology Resident, Medical Research Institute, Alexandria University

Introduction:

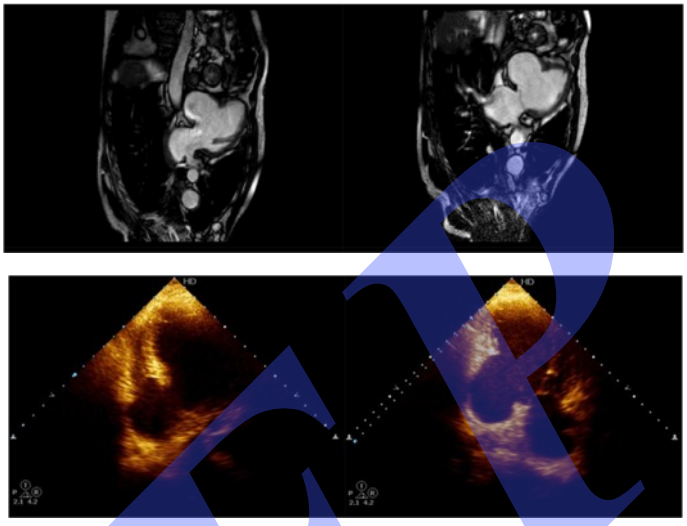
Mechanical complications of acute myocardial infarction (AMI) are mainly ventricular septal rupture (VSR), free wall rupture, and ischemic mitral regurgitation. If the patient survives the acute phase, negative remodeling starts to occur leading to aneurysm formation.
Despite their rareness, our case showed two of those mechanical complications at the same setting.

Case Report:

A 72-year-old male patient, a smoker with a past medical history of hypertension but no diabetes, presented to our out-patient clinic complaining of dyspnea grade III that had started 3 months ago and progressed gradually with no history of any acute event in the past.
On examination he was hemodynamically stable with a systolic murmur heard over the parasternal area.
Transthoracic echocardiography showed a large inferior wall true aneurysm with a large ventricular septal defect located at the basal inferoseptal segment with left to right shunt.

As another modality to confirm the diagnosis, cardiac magnetic resonance (CMR) revealed the same echocardiography data.

Patient underwent invasive coronary angiography that revealed proximal 70% stenotic lesion in the proximal part of the left anterior descending (LAD) coronary artery and thus was sent for surgery.



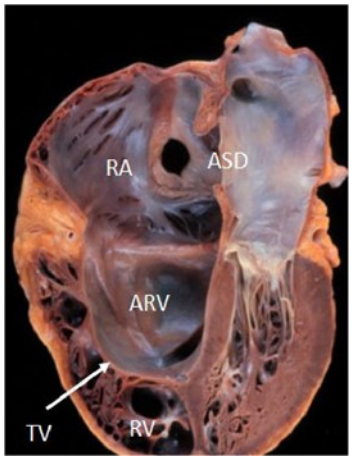
Conclusion:

- Left ventricular aneurysms probably develop in less than 5% of all ischemic patients (inferior wall aneurysms constitute only 3% of all aneurysms)
- Bedside echocardiography is still the mainstay procedure for diagnosis of mechanical complications following AMI
- Cardiac MRI (CMR) is most sensitive and specific investigation for identifying and assessing these aneurysms preoperatively.

Congenital Heart Disease with Pregnancy- Case

Dr.Alaa Khalil, Consultant cardiology, IMC, Jeddah, KSA

26 years lady with H/O congenital heart disease presented to cardiac clinic seeking for advice about pregnancy,She had medical report indicating that she has Severe Ebestein malformation,Small to moderate size PDA,SVT. At the age of 6 years ,She was taken to cath lab. To attempt occluding her PDA ,incidentally she was discovered to have severe left pulmonary artery stenosis at the point where the PDA inserted into the left pulmonary artery which was stented ,She lost medical F/U since she was 10 y old.



She admitted that she is 6 weeks pregnant and wish to continue pregnancy Upon examination, she was asymptomatic , hemodynamically stable, mild cyanosis of fingers and toes, splitted first heart sound ,ECG: NSR , biaterial enlargement with RA>LA. Both Transthoracic and transesophageal Echo revealed Severe Ebestein malformation with hypoplastic RV . Huge IAS aneurysm with significant R-→ L shunt. Small PDA. Case was discussed in our combined cardiology and cardiac surgery meeting ,the consensus was: 1- She can continue pregnancy with close OPD F/U 2- Start clexan sc prophylaxis for DVT till the end of pregnancy 3- Home oxygen with pulmonologist F/u 4- Involve her obstetrician with treating team 5- For definitive surgery to be decided after delivery Fortunately , she tolerated the pregnancy well till the end of 8 months when the fetus started to be distressed so urgent conjoint meeting between her obstetrician, cardiologist, cardiac surgeon and anasthiologist , The decision was to proceed for elective CS Successfully she gave birth a nice female baby with low birth wight of 1.86 kg, she tolerated recovery period and D/C home with her baby after one week. We did a literature review about Ebestein and pregnancy which revealed, Ebstein anomaly (EA) is a rare cardiac congenital abnormality characterized by downward displacement of the posterior and septal leaflets of the tricuspid valve of more than 8 millimetres per square meter body surface area which results in Atrialization of the right ventricle, enlargement of the right atrium and tricuspid regurgitation. 80% have

atrial septal defect or patent foramen ovale Affected individuals experience a wide spectrum of clinical severity, ranging from heart failure in infants to asymptomatic adults Other clinical presentations include cyanosis, arrhythmias and paradoxical emboli through atrial level shunts. Since most patients survive to childbearing age,Careful planning of labor and delivery and avoidance of massive fluid overload can often prevent the consequences of hemodynamic stress and to avoid cyanosis, heart failure and arrhythmias. Vaginal delivery is often preferred since has been shown to be safe .The ACC/AHA Guidelines indicated that ,Most women have a successful pregnancy with appropriate care but there is a risk of low birth weight and fetal loss if significant cyanosis is present.

DIAGNOSTIC VALUE OF ELECTROCARDIOGRAPHIC ST-T WAVE CHANGES IN LEAD aVL IN PATIENTS WITH CHRONIC STABLE ANGINA

Awad Youssef Zeid, MsC., Member of ESC, ACCA, EL Mamoura Chest Hospital, ICC, Alexandria

ECG is a simple and non-invasive bedside diagnostic tool with a well-established role in the diagnosis of CAD.
This study was a prospective observational study on 156 patients admitted at Alexandria university hospitals with documented CAD.

We noticed that inverted T wave in lead aVL was found in 56 patients (73.7%) patients with MILAD lesions (p value <0.001) while T wave was either upright or flat in 10 patients each (13.2%).

T wave was upright in 48 patients without MILAD lesions (60%) (p value <0.001) while it was flat or inverted in 17 and 15 patients (21.3%, 18.8%).
Regarding ST segment, depressed ST segment was found in 12 patients with MILAD lesion (15.8%), isoelectric in 57 patients (75%) and elevated in 7 patients with MILAD lesions (9.2%).

In patients without MILAD lesions, ST segment depression was found in 10 patients (12.5%), while it was isoelectric in 69 patients (86.3%) and elevated in 1 patient (1.3%).

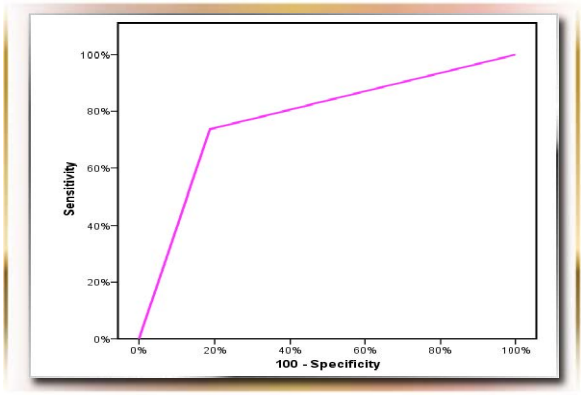


Figure shows the ROC curve for Inverted T AVL to predict MID LAD cases

EARLY BP CONTROL CUTS CV EVENT RISK HYPERTENSION PATIENTS

Dr Mouhamadoul Mounir DIA, General-Secretary of Senegalese Society of Cardiology
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Introduction: Several recent studies show that early control of BP significantly reduces the risk of cardiovascular events in hypertensive patients.

Blood pressure targets and control time: The current recommendations (ESC 2013, JNC 8) agree on a target of 140/90 mm Hg in the general population, 150/90 mm Hg for the elderly. A target of 140/85 mm Hg can be considered in case of diabetes, nephropathy or cardiovascular disease. However, the SPRINT study set the stage for a reduction of this goal. There is as yet no consensus on the period of time to achieve this goal.

Controling BP reduces CV risk: The reduction of the risk of cardiovascular events of the hypertensive patient requires a control of the BP regardless of the drug used. Studies in recent decades have amply demonstrated this. An A. Zanchetti meta-analysis of 68 major therapeutic trials showed that a reduction of 10 mm Hg of systolic BP and 5 mm Hg of diastolic BP for 5 years reduced heart failure by 46%, stroke 37%, myocardial infarction by 22%, cardiovascular mortality by 20% and cause mortality by 12%.

Need for early BP control: More recently, several studies have shown that this BP control must be early for a better reduction of cardiovascular events in hypertensive patients.

Thus, a post-hoc subgroup analysis of the FEVER study, including 9711 patients, noted a significant reduction in cardiovascular events according to the time of blood pressure control. The benefit was all the greater when the BP was controlled early within 1, 3 or 6 months. Similarly, all-cause mortality was significantly reduced in patients under control for 1 month.

Early blood pressure control cuts CV event risk
(adapted from Zhang Y. at European Society of Hypertension 2016 Annuel Meeting)

Outcome	BP controlled at	HR*	95% CI	p
Stroke	1 month	0.67	0.52-0.86	0.002
	3 months	0.66	0.54-0.82	0.0001
	6 months	0.73	0.60-0.90	0.003
All CV events	1 month	0.61	0.49-0.75	<0.0001
	3 months	0.70	0.59-0.84	0.0002
	6 months	0.75	0.63-0.90	0.002

*HR=hazard ratio

The SPRINT study, beyond the controversy over blood pressure targets, showed a real benefit of early BP control with intensive treatment. The number of cardiovascular events was reduced by 25% and the total mortality by 27%.

The international guidelines do not yet recommend a time limit during which blood pressure control should be achieved. Only the french "Société Française d'Hypertension Arterielle" suggests a control of the BP before 6 months.

Conclusion: In light of recent morbidity and mortality data, future recommendations should address early control of BP. A period of 3 to 6 months would be reasonable.

Keywords: blood pressure, early, hypertension, event, cardiovascular

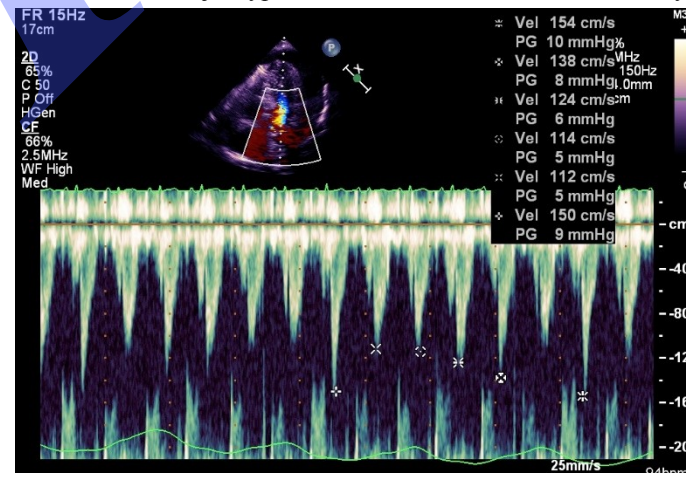
Echo in The Evaluation of Shock States

Dr. Hatem A. Soliman, MBBS, MSc, MRCP, Dip. Card. (London), ASCeXAM (USA)

Echocardiography is becoming pivotal in the diagnosis and management of the shocked patient. Important characteristics in the setting of shock are that it is readily available, non-invasive, safe and basic knowledge and skills can be enough to diagnose and address life threatening conditions. In the acute situation a basic study often yields immediate results allowing for the initiation of an emergency therapy, while a follow-up with a more advanced study has the advantage of further refining the diagnosis and providing an in-depth assessment and evaluation of the patient's hemodynamic status.

Although previously considered to be solely within the arena of Cardiologists, the latest advances in bedside ultrasonography has led to the infiltration of Echocardiography into the specialty of Critical Care Medicine. Competency in basic Critical Care Echocardiography is now regarded as a mandatory part of Critical Care training in many countries with clear guidelines available. The vast majority of abnormalities found in shocked patients are readily identified using 2D and M-mode Echocardiography. A more comprehensive assessment can be done with more advanced levels of competency, for which practice guidelines are also now available. Hemodynamic evaluation and ongoing monitoring are possible with advanced levels of competency, which includes the use of Color Doppler, Spectral Doppler, and Tissue Doppler Imaging and occasionally the use of advanced Echocardiographic modalities such as 3D Echocardiography or Strain Imaging.

The four main types of shock are Cardiogenic, Hypovolemic, Obstructive, and Distributive and they all can readily be identified by Echocardiography. Even within each one of these four major types in the shock classification, a variety of pathologies may be the cause and echocardiography will differentiate which of these is responsible.



In the majority of cases we encounter in acute cardiac care situations, the shock is multifactorial, such as a combination of cardiogenic and septic shock or hypovolemia and dynamic left ventricular outflow tract (LVOT) obstruction. In Septic Shock - an important example of Distributive Shock - bedside Echocardiography has been lately introduced in the Surviving Sepsis Campaign bundles of care of such patients as a vital bedside hemodynamic monitoring tool.

The diagnostic and therapeutic benefit of Echocardiography in the shocked patient is obvious and it is regarded as a life-saving and a game-changing tool at the bedside.

Echocardiographic Assessment of LA & RA Function

Antoine Abdel Massih, Cairo

Atrial functions are classically divided into:
1-First, as a reservoir, the atrium stores venous return during ventricular contraction and isovolumetric.
2-Secondly, as a conduit the atrium transfers blood passively into the ventricle.
3-Thirdly, the atrium actively contracts during the final phase of diastole and contributes between 15 and 30% of ventricular stroke volume.

As a continuum of the ventricle, especially during diastole, its size and function are very much influenced by the compliance of the ventricle and is a good predictor of ventricular dysfunction.
Several methods exist for assessment of atrial functions ranging from 2D echocardiographic assessment of atrial volumes to 3D derived assessment of same volumes. (Fig 1a)
Newest technique for assessment is the study of atrial deformation using speckle tracking. (Fig 1b)

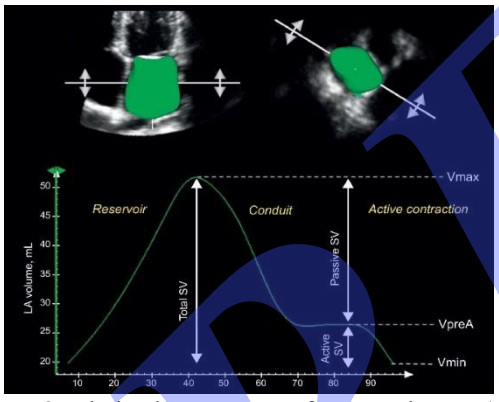


Fig (1a): Graphic presentation of atrial volumes

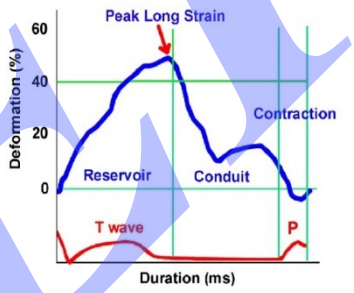


Fig (1b): Graphic Presentation of atrial deformation

Egyptian Knowledge Bank

Yasmin Hussein El-Sobky, Drug Information consultant at NAPHS Consultancy Co., Board Certified Pharmacotherapy Specialist (BCPS), Master of Clinical Pharmacy, Biostatistics diploma, Google Certified Educator (GCE-1)

Toward Egyptian Society that "Learns… Thinks… innovates" is the main concept of the Egyptian Knowledge Bank (EKB) project that was launched by the President Abdel El-Fattah El-Sisi to be the biggest digital library in the world, housing contents of the most prominent publishing houses all over the world such as ElSevier, Wiley, Cambridge, Oxford, Reuters, National Geographic, Discovery education, Britannica and others.

Egyptian Knowledge Bank is one of the largest National Projects that concerns with education in Egypt and aims to provide a huge and diversified sources for knowledge and culture that will boost the country to a better future.

CardioAlex session will focus on presenting the available resources that become accessible to the Egyptian healthcare cardiology practitioners - on a free of charge basis- as well as how EKB can help practitioners to improve their academic and practice levels.

EGYPTIAN KNOWLEDGE BANK
TOWARD EGYPTIAN SOCIETY THAT "LEARNS… THINKS… INNOVATES"

Ischemic Heart Disease

Sameha Abdallah Abd El Nany Ashour, Graduated from: British University in Egypt, As-Salam international Hospital & El Galaa Military Hospital., Charge Nurse in Cardiac Catheterization Lab.

The heart is the vital organ that tirelessly pumps oxygenated blood from the lungs to the organs and peripheral tissues via the circulatory system. In return, deoxygenated blood is returned via the heart and the pulmonary circulation to the lungs to expel waste carbon dioxide. The average human heart beats approximately 72 beats per minute totaling around 2.5 billion beats in a 66-year lifespan. The human heart weighs 250-300g in females and 300-350g in males. The heart is located in the mediastinum of the thorax, anterior to the vertebrae and posterior to the sternum.

The atherosclerotic process responsible for restriction of blood flow in the coronary arteries is a multifactorial process and is initiated by damage to the endothelium. Ischemia may manifest in many forms. Most commonly, patients present with chest pain on exertion, in cold weather or in emotional situations. This discomfort is known as angina pectoris. Patients may present with acute chest pain at rest which typically radiates down the left arm and up the left side of the neck. Patients may experience nausea, vomiting, sweating and enhanced anxiety. There is no single causative risk factor for the development of IHD. A number of genetic and environmental risk factors have been established as causative in the development of the atherosclerotic lesion. Smoking and obesity cause 36% and 20% of IHD respectively. Furthermore, there is linking between a sedentary lifestyle and a lack of exercise with a risk of IHD.

According to the World Health Organization, chronic diseases of which heart disease is the single largest contributing category; are responsible for 63% of all global death. Non communicable diseases kill 9 million people under the age of 60 every year which has a profound socio-economic impact.

It is predicted that by 2030 - 23 million people will die from a CVD. Data from the USA suggests that CVD was responsible for 34% of deaths in 2006 and over 151,000 Americans who died were less than 65 years old. The incidence of CVD is declining in the World even though rates of lifestyle associated risk factors such as obesity, smoking and type II diabetes mellitus are increasing. The decline is in part due to advances in therapeutic and invasive intervention. In creating better outcomes for those with acute cardiac conditions, patients develop heart failure which requires longer term treatment and monitoring and may in fact be a greater health burden than the acute events themselves

Management of problematic DDIs facing CCU professionals "... When medicines fight each other..."

Heba El-naggar- Clinical pharmacist

The human population is a total mixture, for this reason human beings do not respond uniformly to one or more drugs. Our genetic makeup, ethnic background, sex, renal and hepatic functions, diseases and nutritional states, ages and other factors (the route of administration, for example) all contribute towards the heterogeneity of our responses. This means that the outcome of giving one or more drugs to any individual for the first time is never totally predictable.

The variability in patient response has lead to some extreme responses among prescribers. Some clinicians have become over-anxious about Interactions so that their patients are denied useful drugs that they might reasonably be given if appropriate precautions are taken.

At the other extreme, there are some health professionals who, possibly because they have personally encountered few interactions, fail to consider drug interactions, so that some of their patients are potentially put at risk.

Patients with cardiovascular disorders are at high risk for DDIs because of the types and number of drugs they receive. The severity and likelihood of a given DDI varies and depends on the pharmacokinetic and pharmacodynamic properties of the object drug and the precipitant drug. In addition, predicting DDIs is often difficult because of large interpatient variability in drug disposition and clinical response; however, an understanding of these properties will improve the ability of the clinician to predict potential interactions.

It is estimated that≈2.8% of hospital admissions occurs as direct result of DDIs. However, the actual incidence of hospitalization secondary to clinically significant DDIs is likely to be highly underestimated because medication-related issues are more commonly reported as adverse drug reactions.

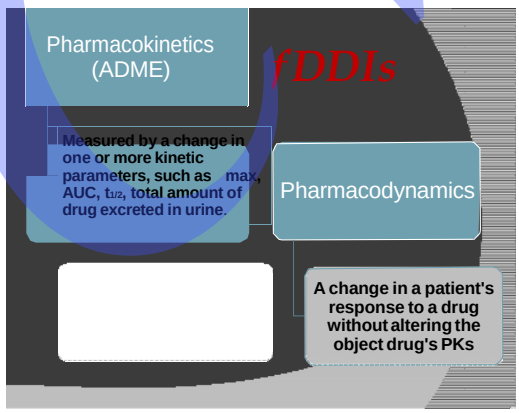
The clinical impact of a DDI can range from mild to life threatening. Therefore, not all DDIs require a modification in therapy. The variability in the clinical significance of a DDI depends on both **medication-specific** and **patient-specific factors**.

Medication-specific factors include the individual pharmacokinetic characteristics of each medication implicated in the DDI (binding affinity, half-life ($t_{1/2}$), dose of the medications, serum concentrations, timing and sequence of administration, and duration of therapy. Patient-specific factors include age, sex, and lifestyle, genetic polymorphisms causing differences in enzyme expression or activity, and disease impairment affecting drug metabolism (e.g. hepatic or renal impairment, cardiac failure) or predisposition to differences in efficacy or safety

The primary factors that define clinical significance include: **SIGNIFICANCE RATING**; the time of **ONSET** of the effects of the interaction; the potential **SEVERITY** of the interaction; and the **DOCUMENTATION** that an interaction occurs clinically.

Clinically significant DDIs are usually preventable. To optimize patient safety, health care providers must have an understanding of the mechanisms, magnitude and potential consequences of any given DDI. Also, this will assist clinicians in the safe prescribing of medications and permits careful consideration of the benefits and risks of concomitant medications. Moreover, it enables clinicians to make well-informed decisions to provide evidence-based and cost-effective health care as safely as possible.

Health care professionals need to be aware of drug interaction resources that identify immediacy and severity of interactions, and be able to describe the result of the potential interaction and suggest appropriate interventions. It is also incumbent on the health care professional to be able to apply the available literature to a situation. The professional must be able to individualize recommendations based on patient-specific parameters. Although some authorities suggest adverse reactions resulting from drug interactions may be less frequent than originally believed, the health care professional should protect the patient against harmful effects of drugs, particularly when they can be anticipated and prevented.



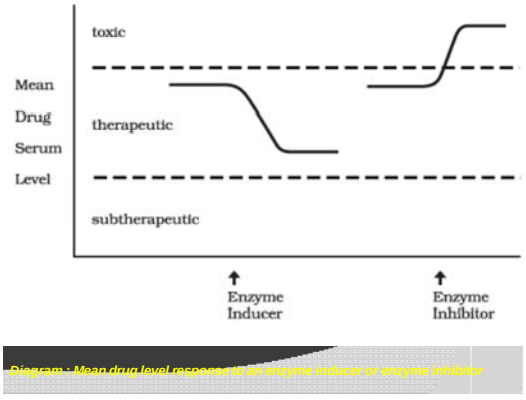


Diagram : Mean drug level response to PK enzyme inducer or enzyme inhibitor

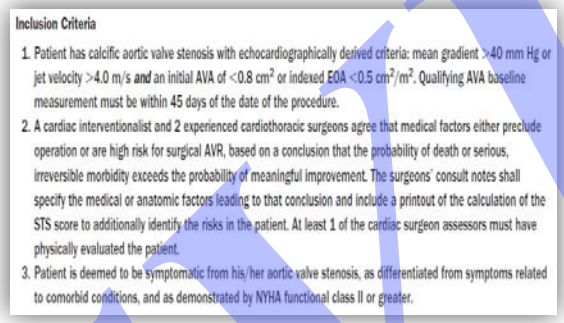
New updates on TAVI management: Anesthetic Management Of Patients Undergoing Trans Catheter Aortic Valve Implantation

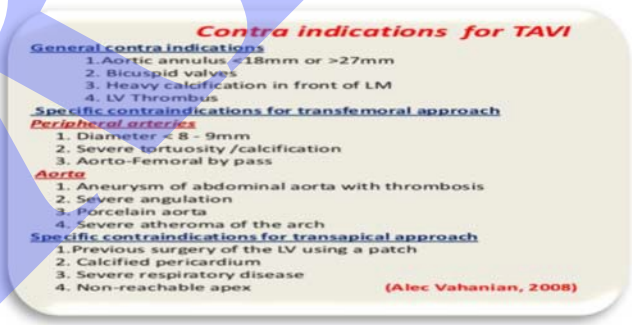
Reham Al.Eskandarany, BSN, Edwards TAVI Coordinator in Kuwait

Introduction:
Degenerative Aortic Stenosis (AS) is the most frequently occurring heart valve disease, with a prevalence of 4.6% for ages over 75 and represents the most common indication for valve surgery. Conventional aortic valve replacement (AVR) using cardiopulmonary bypass (CPB) is considered the treatment of choice in symptomatic AS, but in the last 10 years, many institutions have adopted the Trans catheter aortic valve implantation (TAVI) for patients with very high surgical risk.

History of TAVI

2002: ALAIN CRIBIER et al, Described TAVI after transcatheter valvuloplasty.
2007: Europe approved TAVI of Edwards Sapien & Core valve.
2009: Kuwait's TAVI program started.
Nov 2011: USA Approved TAVI after PARNER Clinical trial.
2012: European statistics presented during Cardio Egypt, descripted TAVI exceeding 51% of valve procedures during the previous year.
Worldwide: TAVI was used for around 11.000 high risk patients.

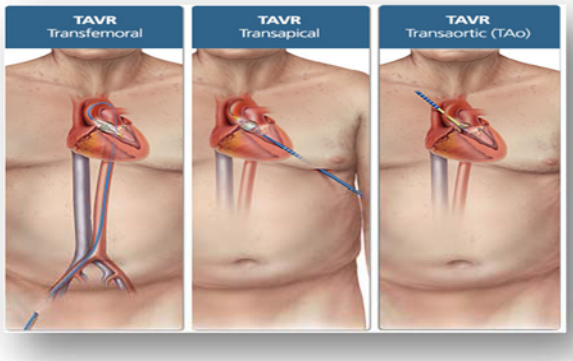




Indications
TAVI Approach
Anesthetic Considerations

* Pre- operative assessment: Elder patients, multiple comorbidities (CVD, renal insufficiency, Arrhythmia & pulmonary diseases).
*Back up: CCU bed, blood reservation, cardiac and vascular surgeons, CPB, theater.
*Clear Plan: Airway, lines, anesthesia techniques, orthopnea, Premeditations & inotropes.
*Discuss with the cardiologist any concerns & the approach.
*Patient Preparations.
*Induction (Most critical step).
*Hemodynamic stability is the main goal during TAVI using Perioperative Goal-Directed Therapy (**PGDT**)-**Onassis Cardiac Center Study**.
*Anticoagulation.
*Pacing & prosthesis deployment.

*Post-Operative Care & Hemodynamic Monitoring using PGDT.



New updates on TAVI management

**As per STUDY of Onassis Cardiac Center, Athens, Greece -published in Journal of Cardiothoracic & Vascular Anesthesia, Vol 28, and No 2 April, 2014: pp. 285-289. *It's a retrospective study comparing 2 anesthesia techniques; general anesthesia (GA) & monitored anesthesia care (MAC). Monitoring: 5-lead ECG, IBP, Spo2, CVP , pulmonary artery pressure , ScVo2 , CO , CI , SVV, SVR , urine output, inspired & end-tidal oxygen, CO2 & inhaled anesthesia concentration.

*98 patients with sever AS & a high logistic EuroSCORE (not eligible for AVR).

*A radial artery catheter was placed for the continuous invasive systemic blood pressure monitoring & connected with a FloTrac sensor to Flotrac/Vigileo monitor (Edwards Life sciences). **CO (CI=CO/BSA=SV x HR/BSA or CI= 80x (MAP- CVP)/SVR x BSA**

*Intraprocedural hemodynamic stability was maintained according to continuous CI monitoring which allows a more accurate optimization of cardiac performance than simply noting the needed amounts of inotropic support.

Assessment of Left Ventricular Mechanics Before and After Surgical Myectomy in Patients With Hypertrophic Obstructive Cardiomyopathy, Using Two Dimension Speckle Tracking Echocardiography.

Taher Said Abd Elkareem, Al Azhar

Objectives: To detect changes in Left ventricular mechanics after surgical myectomy in patient with hypertrophic obstructive cardiomyopathy.

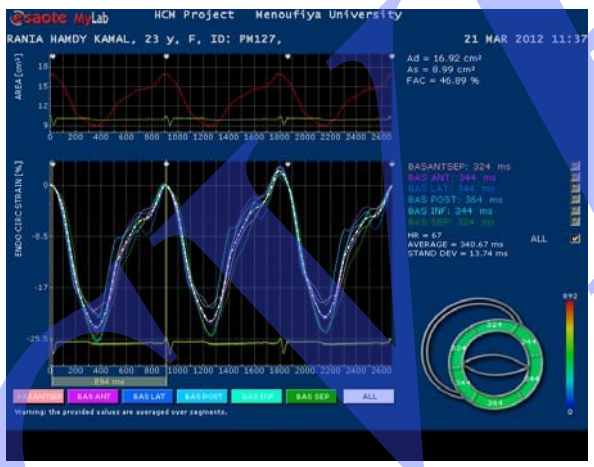
Background: Septal myectomy is the gold standard method to relieve left ventricular outflow tract pressure gradient (LVOT PG) in patients with Hypertrophic Obstructive Cardiomyopathy (HOCM). Myocardial mechanics are abnormal in those patients, demonstrating low longitudinal

strain, high circumferential strain, and high apical rotation compared with healthy subjects. The aim of this study was to determine whether functional improvement after myectomy is associated with improved myocardial mechanics.

Methods: A total of 15 patients (60% males and 40% female)**.** with HOCM refractory to medical treatment were subjected to septal myectomy, Clinical data and paired echocardiographic studies before and within 6 monthes after myectomy were analyzed and compared. Myocardial mechanics including longitudinal and circumferential strain and rotation and LV synchronization were assessed using two-dimensional strain software (Velocity Vector Imaging).

Results: Results showed significant symptomatic relief, Left ventricular outflow gradient decreased dramatically from 63.13 ± 10.25 to 9.96 ± 2.72mmHg; P < 0.0001, and left atrial volume index decreased from 37.8 ± 5.61 to 26.38 ± 3.37 cm³/m²; P < 0.05. E/e´ decreased from 15.23 ± 2.39 to 9.18 ± 1.42; P < 0.05, Low longitudinal strain decreased at the myectomy site (basal septum), increased in the basal inferior segment, and remained unchanged globally -6.43 ± 6.54 to -8.70 ± 2.30; P 0.232. High circumferential strain decreased from -28.47± 3.35 to -18.26 ± 2.86, P < 0.05. High left ventricular twist normalized from 16.52 ± 2.25 to 14.02 ± 2.27, P < 0.05.

Conclusion: Patients with HOCM show mechanical adaptations to chronic elevated afterload like patients with severe aortic stenosis in whom increased circumferential strain, increased basal and apical rotation and LV twist, However within 6 monthes after myectomy Global longitudinal strain remained unchanged, circumferential strain and rotation decreased, LV twist normalized and LV dyssynchrony showed no significant changes. Thus improvement of symptoms after myectomy is mainly due to improvement of the predictors of diastolic function.



NOACS: A Patient Planned for Intervention or Surgery

Prof. Samir M. Rafla, FACC, FESC, FHRS, mEHRA. Cardiology Dept. Alexandria University

Surgical interventions or invasive procedures that carry a bleeding risk require temporary discontinuation of the NOAC. Trials have shown that about one quarter of patients that are in need for anticoagulant therapy require temporary cessation within 2 years.

The BRIDGE trial has now shown that bridging with LMWH has no benefit regarding thromboembolism but is inferior concerning major bleeding.
Registry data have shown that bridging is still inappropriately used in NOAC patients, leading to a significantly higher peri-procedural bleeding rate (without lower thrombo-embolic rate).

Table 1: Last intake of drug before elective surgical intervention

	Dabigatran		Apixaban–edoxaban–rivaroxaban	
	No important bleeding risk and/or adequate local haemostasis possible: perform at trough level (i.e. ≥12 or 24 h after last intake)			
	Low risk	High risk	Low risk	High risk
CrCl ≥ 80 mL/min	≥24 h	≥48 h	≥24 h	≥48 h
CrCl 50–80 mL/min	**≥36 h**	**≥72 h**	≥24 h	≥48 h
CrCl 30–50 mL/min[a]	**≥48 h**	**≥96 h**	≥24 h	≥48 h
CrCl 15–30 mL/min[a]	Not indicated	Not indicated	**≥36 h**	**≥48 h**
CrCl < 15 mL/min	No official indication for use			
There is no need for bridging with LMWH/UFH				

It is more practical to have the intervention scheduled 18–24 h after the last intake, and then restart 6 h later, i.e. with skipping one dose for BID NOAC.
Special considerations concerning atrial fibrillation ablation procedures
There has been a recent shift towards performing AF ablation on uninterrupted VKA therapy with target INR of 2.0–2.5. Whether such an approach is safe in patients on NOAC therapy is less clear.

When NOAC is last taken ≥36 h before the intervention, a transoesophageal echocardiography (TOE) should be considered before ablation. The same applies if adherence to correct NOAC intake in the weeks before ablation is doubtful.

Special considerations concerning device implantation procedures

For NOAC treated patients, the global scheme is timed cessation before intervention, without bridging, and restarting a few hours up until 2 days afterwards (depending on CHA2DS2-VASc risk). Smaller studies did not show a benefit of uninterrupted NOAC .

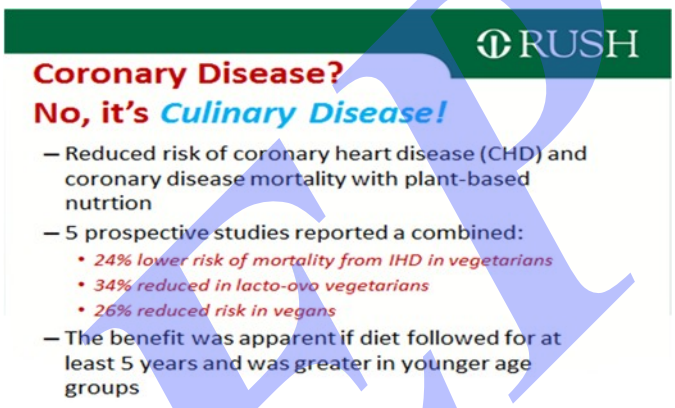
Patients requiring an urgent surgical intervention

If an emergency intervention is required, the NOAC should be discontinued. Surgery or intervention should be deferred, if possible, until at least 12 h and ideally 24 h after the last dose.
Table 2- Classification of elective surgical interventions according to bleeding risk
Interventions not necessarily requiring discontinuation of anticoagulation
Interventions with minor bleeding risk (i.e. infrequent or with low clinical impact)
Interventions with major bleeding risk (i.e. frequent and/or with high impact)

Nutrition and Heart Disease

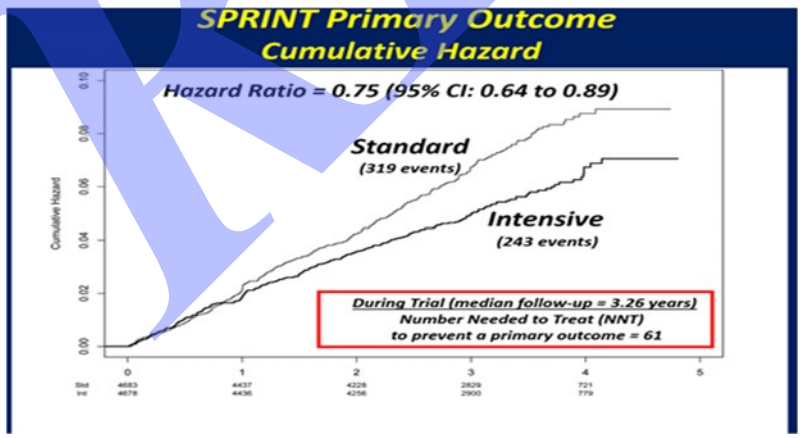
Kim Allan Williams, Sr., M.D., MACC, FAHA, MASNC, FESC

If everyone on the planet was a thin, daily exercising, vegetarian, we would have very little need for cardiology. Plant-based nutrition has been associated with a decrease in diabetes, hypertension, dyslipidaemia, stroke, myocardial infarction, cardiovascular death and all-cause mortality.



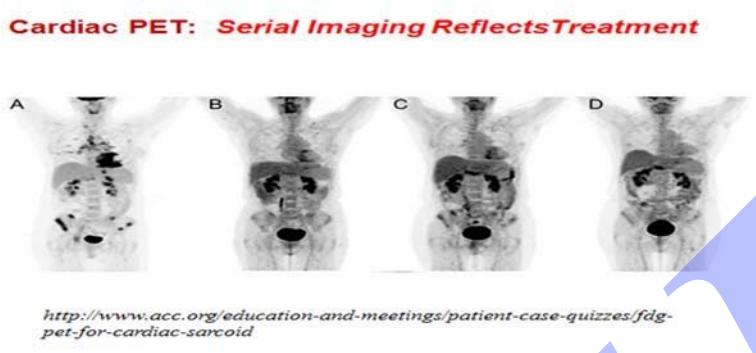
Recent Treatment of hypertension 2017

If everyone on the planet was a thin, daily exercising, vegetarian, we would have very little need for hypertensive therapy. Our hypertension guidelines emphasize lifestyle (diet and exercise) but this is largely not followed by patients. In addition, there are multiple treatment guidelines that conflict with one another. The SPRINT trial indicates that intensive BP control (target 120 systolic) improves outcomes dramatically.



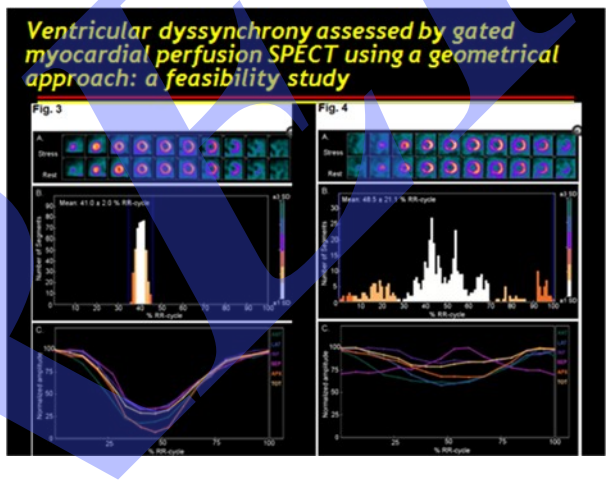
Imaging in Infiltrative Myopathies

Little used and under recognized, planar imaging with Tc-99m-pyrophosphate is an excellent tool for the evaluation of myocardial amyloid deposition. It can be used to predict outcome based on the degree of uptake. FDG PET has become the cornerstone of the evaluation of myocardial sarcoidosis. It can be used to monitor the success of immunosuppressive therapy.



Scintigraphic Evaluation of Myocardial Dyssynchrony

Little used and under-recognized, SPECT MPI is an excellent tool for the evaluation of myocardial synchrony. It can be used to predict success of cardiac resynchronization therapy. Using a 4-D imaging of regional mechanical timing improves outcomes by guiding location of LV pacing lead for biventricular devices.

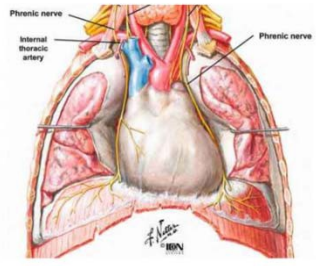


Pericardial Anatomy Relevant To Epicardial Access

Prof. Ibrahim Khadragi, Cardiothoracic Surgery, Faculty of Medicine, Alexandria University, Egypt

The focus of this presentation is to review the pericardial anatomy relevant to epicardial access. The epicardial surfaces of both ventricles are free of reflections. This allows for easy manipulation of the mapping/ablation catheter during ventricular epicardial ablation. Catheter exploration of the transverse sinus allows access to the anterior portion of the LA, the area of Bachman's bundle. The presence of epicardial fat interposed between the radiofrequency ablation catheter and the epicardium can decrease the effectiveness of ablation.

RELATIONSHIPS
1. Phrenic nerves
2. Internal Mammary Artery
3. Lung
4. Diaphragm
5. Liver
6. Heart



Ablation overlying posterolateral right atrium, right superior pulmonary vein left atrial appendage, lateral left ventricle may damage the phrenic nerves, which are immediately external to the pericardium.

Pheochromocytoma: Current Approaches And Future Directions

Hanaa Tarek El Zawawy, Alexandria

Pheochromocytoma (PCC) is a neuroendocrine tumor of the medulla of the adrenal glands (originating in the chromaffin cells) that secretes excessive amounts of catecholomines, which are very powerful vasoactive hormones.

About 68% of the cases occur sporadically, 13% associated with Von Hippel Lindau syndrome, 6% associated with succinate dehydrogenase subunit B gene mutation, 5% associated with multiple endocrine neoplasia type 2, 4% associated with succinate dehydrogenase subunit D gene mutation, and 4% associated with neurofibromatosis type.

The estimated annual incidence is 2 to 8 per million person. The average age at diagnosis is 24.9 years in hereditary cases and 43.9 years in sporadic cases. Men and women equally affected.

Based on biochemical secretory patterns, PCCs can be characterized into three different phenotypes: Noradrenergic, adrenergic, and dopaminergic phenotypes predominantly producing norepinephrine, epinephrine and phenotype predominantly produce dopamine.

PCC accounts for 0.2 % to 0.6 % of cases of hypertension in the community. Hypertension caused by this tumor is usually curable. Classical presentation is that of paroxysmal hypertension, associated with palpitation, sweating, headache & anxiety. PCC can present with sustained hypertension or strikingly with hypotension (orthostatic/paroxysmal) due to intense α-adrenergic mediated vasoconstriction with volume contraction, β-adrenergic mediated vasodilatation, or tumor release of Adrenomedullin (vasodilatory neuropeptide).

PCC can cause catecholamine-induced cardiovascular complications beyond hypertensive effects alone that carry a much higher risk of morbidity and mortality including: catcholamine induced cardiomyopathy, cardiac dysrhythmia & conduction defects, myocardial infarction, and heart failure.

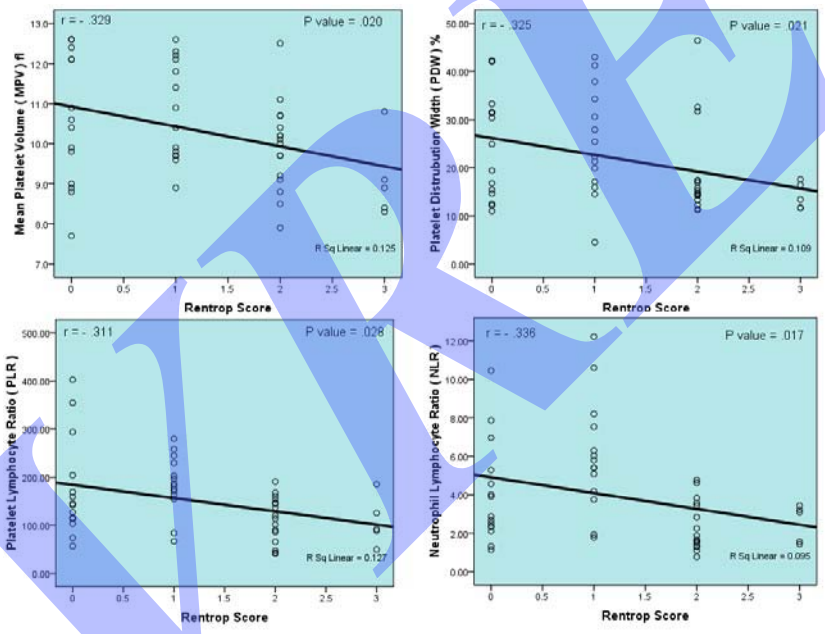
The diagnosis of Pheochromocytoma depends mainly upon the demonstration of catecholamine excess by 24-h urinary metanephrines, plus tumor localization by multiphasic CT or by nuclear scanning following the biochemical confirmation. Recent imaging modalities CT/PET scan and MRI/MIBG scan can give clue about tumor localization as well as function.

Definite treatment of pheochromocytoma is surgical resection. Medical treatment includes selective α1-blocker, α + ß blockade, and/or calcium channel blockers. Hypertensive crisis is controlled with IV phentolamine, IV nitroprusside, or short acting ß blockers. Radionuclide treatment can be considered in patients with metastatic, surgically incurable or recurrent PCCs. Gene & molecular-targeted therapies are new promising strategies in the treatment of Pheochromocytoma by the interference with specific molecular targets along the oncogenic signaling pathways responsible for both benign and malignant PCC gene mutations, ex: Hypoxia inducible factor (HIF) inhibitors, vascular endothelial growth factor (VEGF) inhibitors, or mTOR inhibitor (everolimus) in combination with octreotide.

Platelet Activity.. Can it play a role in development of coronary collateral circulation?

Ahmed Ashraf Darwish - Zagazig University

Coronary Collateral Circulation is an adaptive mechanism by which the heart maintain adequate cardiac muscle perfusion and survive myocardial ischemia . It has been recognized as a fact that collateral circulation plays a major role in survival of myocardium in patients suffering chronic total occlusion . Several studies have shown that mortality is obviously less in CTO patients with good collaterals compared to those with poor collaterals . But till now , All known explanation stand short of justifying the variability in development of collaterals in patient with coronary artery disease. It's well known that burden of coronary stenosis and diabetes mellitus mainly affect development of collateral circulation. However , Inspite of having similar degrees of coronary obstruction , Patients develop varying degrees of collaterals.



This diagram demonstrate negative correlation between Rentrop score & (MPV , PDW , NLR & PLR)

In our study, we tried to assess the role of both inflammations represented by neutrophil lymphocyte ratio (NLR) & platelet lymphocyte ratio (PLR) and platelet activity represented by mean platelet volume (MPV) & platelet distribution width (PDW) in the development of coronary collateral circulation in CTO patients. We used CTO patients specifically to standardize the degree of coronary obstruction. Rentrop score was used as a marker for collateral circulation.

Statistically MPV and PDW were strong independent predictors of degree of collateral circulation. Rentrop score was negatively correlated with MPV, PDW, NLR & PLR. As a conclusion, our data suggests a strong association between inflammation & platelet activity and collateral circulation development .

Prophylactic Antibiotic Regimens in Cardiac Surgeries

Dalia Ismail Mohammed, Clinical pharmacist Gamal Abd El Nasser Hospital, Clinical pharmacy and Hospital D, Pharm D Candidate

1- Definition of SSI

CDC Definitions for Surgical Site Infection: Infection occurs within 30 days after the operation and infection involves only skin and subcutaneous tissue of the incision and at least one of the following: g:

1. Purulent drainage with or without laboratory confirmation, from the superficial incision
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision
3. one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat and superficial incision is deliberately opened by surgeon, unless incision is culture-negative
4. Diagnosis of superficial incisional SSI made by a surgeon or attending physician

2- Importance of antimicrobial prophylaxis in cardiac surgery

Rare but serious complications
After cardiac procedures. In patients undergoing CABG, the mean frequency of SSIs depending on NHSN SSI risk index
Category ranges from 0.35 to 8.49 per 100 operations.
The mean frequency of SSIs depending on NHSN SSI risk index category for patients undergoing CABG with only chest incisions ranges from 0.23to 5.67 per 100 operations. Most of these infections are superficial in depth.

3- Risk factors increase SSI.

These include diabetes, hyperglycemia, peripheral vascular disease, chronic obstructive pulmonary disease, obesity (BMI of >30 kg/m2), heart failure advanced age, reoperation, increased number of grafts, long duration of surgery, *S. aureus* nasal colonization. Patients requiring extracorporeal membrane oxygenation(ECMO)

4-Common pathogens

Almost two thirds of organisms isolated in patients undergoing cardiac procedures are gram-positive including: S. aureus, coagulase-negative staphylococcus,

Gram negative organisms are less commonly isolated: Enterobacter species, Pseudomonas aeruginosa, Escherichia coli, Klebsiella pneumoniae.

5-Spectrum of Activity(selection of AB)

Antimicrobial agents with the narrowest spectrum of activity required for efficacy in preventing infection.
Alternative

Antimicrobial agents with documented efficacy are also listed herein. Individual health systems must consider local resistance patterns of organisms and overall SSI rates at their site when adopting these recommendations. Resistance patterns from organisms causing SSIs—in some cases procedure-specific resistance patterns—should take precedence Over hospital wide antibiograms.

**Choice of agent

Cephalosporins have been the most studied antimicrobials for the prevention of SSIs in cardiac procedures.

Both first-generation (cefazolin) and second generation (cefuroxime) cephalosporins have been shown to be effective in reducing SSI in cardiac surgery.

IF high prevalence of MRSA Vancomycin should be considered For alternative antimicrobial for b-lactam

-allergic patients is vancomycin or clindamycin for gram-positive coverage.
When gram-negative pathogens, addition of an aminoglycoside, aztreonam, or a fluoroquinolone may be prudent.

Recommended Doses and Redosing Intervals for Commonly Used Antimicrobials for Surgical Prophylaxis

Antimicrobial	Recommended Dose: Adults[a]	Recommended Dose: Pediatrics[b]	Half-life in Adults With Normal Renal Function, hr[19]	Recommended Redosing Interval (From Initiation of Preoperative Dose), hr[c]
Ampicillin-sulbactam	3 g (ampicillin 2 g/ sulbactam 1 g)	50 mg/kg of the ampicillin component	0.8–1.3	2
Ampicillin	2 g	50 mg/kg	1–1.9	2
Aztreonam	2 g	30 mg/kg	1.3–2.4	4
Cefazolin	2 g, 3 g for pts weighing ≥120 kg	30 mg/kg	1.2–2.2	4
Cefuroxime	1.5 g	50 mg/kg	1–2	4
Cefotaxime	1 g[d]	50 mg/kg	0.9–1.7	3
Cefoxitin	2 g	40 mg/kg	0.7–1.1	2
Cefotetan	2 g	40 mg/kg	2.8–4.6	6
Ceftriaxone	2 g[d]	50–75 mg/kg	5.4–10.9	NA
Ciprofloxacin[f]	400 mg	10 mg/kg	3–7	NA
Clindamycin	900 mg	10 mg/kg	2–4	6
Ertapenem	1 g	15 mg/kg	3–5	NA
Fluconazole	400 mg	6 mg/kg	30	NA
Gentamicin[g]	5 mg/kg based on dosing weight (single dose)	2.5 mg/kg based on dosing weight	2–3	NA
Levofloxacin[f]	500 mg	10 mg/kg	6–8	NA
Metronidazole	500 mg	15 mg/kg Neonates weighing <1200 g should receive a single 7.5-mg/kg dose	6–8	NA
Moxifloxacin[f]	400 mg	10 mg/kg	8–15	NA
Piperacillin-tazobactam	3.375 g	Infants 2–9 mo: 80 mg/kg of the piperacillin component Children >9 mo and ≤40 kg: 100 mg/kg of the piperacillin component	0.7–1.2	2
Vancomycin	15 mg/kg	15 mg/kg	4–8	NA

Preventive strategies: (ACS/NSQIP measure)

1-Preoperative
Control serum blood glucose in patients with diabetes
Administer prophylactic antibiotics within 1 hour before surgery (vancomycin and fluoroquinolones should be administered within 2 hours before surgery) Adjust dose of antibiotics for obesity

2-Intraoperative

Re-dose antibiotics:
In general, antibiotics with short half-lives should be re-dosed at a frequency of 2 times the half-life of the agent.
Goal of re-dosing is to maintain bactericidal concentrations throughout the operation. May be prudent to consider re-dosing prophylaxis intraoperatively if large amounts of fluids and/or transfusions are being administered and blood loss > 1500 cc

3-Postoperative

Monitor and maintain glucose concentrations less than 200 mg/dL
Discontinue prophylactic antibiotics within 48 hours after cardiac surgery. Drains are not sufficient reason to continue prophylactic antibiotics

References

ASHP Therapeutic Guidelines
► These guidelines were developed jointly by the American Society of Health-System Pharmacists (ASHP), the Infectious Diseases Society of America (IDSA), the Surgical Infection Society (SIS), and the Society for Healthcare Epidemiology of America (SHEA).
: Horan TC, Gaynes RP, Martone WJ, Jarvis WR, Emori TG. CDC definitions of nosocomial surgical site infections, 1992; A modification of CDC definitions of surgical wound infections. Infection Control Hosp Epidemiol. 1992; 13 606-608

Reconstructive Surgery In Aortic Valve Endocarditis Complicated By Aortic Root Abscesses or Infection of The Ascending Aorta

Alaa Eldin Farouk, Assistant professor of Cardiothoracic surgery, Cairo University

Periannular extension is one of the most serious complications of aortic valve endocarditis which necessitates prompt surgical intervention with a higher incidence in prosthetic valve endocarditis (PVE) compared with native valve endocarditis (NVE), and in Staphylococcal infections compared with other organisms.

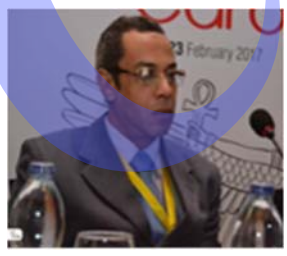
Endocarditis affecting the aortic valve resulting in aortic root abscess formation or spread of infection to the ascending aorta is particularly challenging, and requires aggressive diagnostic and therapeutic approaches as it may result in severe complications such as heart block, destruction of the aortomitral continuity, fistulous communication to other cardiac chambers and extrinsic compression of coronary arteries.

Radical debridement of all infected and necrotic tissues together with adequate reconstruction of cardiac chambers and valves are the cornerstones for successful surgical management of infective endocarditis.

We are going to present some cases with Severe forms of periannular extension, which include cases with Circumferential abscesses causing complete dissociation between the aortic annulus and the LVOT, cases with ruptured abscesses causing intra-cardiac shunts with spread of infection to other cardiac chambers, and cases with pseudo-aneurysms formation in the aortic root or ascending aorta, and the reconstructive surgical technique used in each case.

Relation Between High Sensitivity C-Reactive Protein And Thromboembolic Risk Markers Assessed By Echocardiography In Patients With Non-Valvular Atrial Fibrillation

Abdelhakeem Selem MD, Ahmed Shawky MD, Ahmed Shaker MD
Department of Cardiovascular, Faculty of Medicine, Zagazig University.



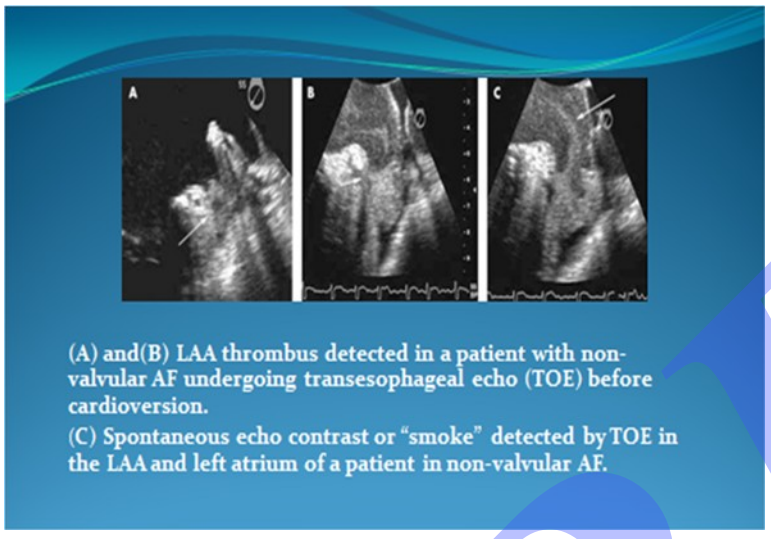
INTRODUCTION: There is strong association between inflammation and atrial fibrillation (AF), as high- levels of high-sensitivity C-reactive protein(hs-CRP) have been noted to be higher among patients with AF. AF promotes thromboembolism through a variety of mechanisms, blood stasis, endothelial dysfunction and inflammation .

OBJECTIVES: This study aimed to assess the relationship between hs-CRP as inflammatory marker and the risk of thromboembolism in patients with non valvular AF.

Methods: This study included 100 patients with non valvular AF referred to trans esophageal echocardiography(TEE) before cardioversion or in patients with stroke to evaluate thromboembolic markers (LAA thrombus, LAA low flow velocity, SEC),transthoracic echocardiography(TTE) to measure LA anteroposterior diameter (AP),LA area, and LV

EF and hs-CRP blood level .The patients divided into two groups Group (A) included 26 patients with hs-CRP ≥4.5 mg/dl Group (B) included 74 patients with hs-CRP<4.5mg/dl.

RESULTS : Group (A) patients were significantly older (p = 0.003), have longer duration of AF (P=0.003), higher left atrial size (LA AP diameter. &LA area P<0.001), lower LVEF (50.923 ±8.291 % vs 57.054±7.83 % P =0.021), higher incidence of thromboembolic markers as LAA thrombus (76.9% vs 18.92% p< 0.001) ,dense SEC (53.84% vs 18.92% p< 0.001) and LAA low flow velocity(17.058± 2.751 vs 26.986± 9.083 ,p < 0.001) and higher CHADSVASc score (4.692 ±1.032 vs 1.838 ± 1.118, p <0.001) compared to group (B) . Hs-CRP showed significant positive correlation with age (r=0.514, p < 0.001) , CHADSVASc (r=0.603, p < 0.001), LA diameter (r=0.628 p < 0.001), LA area (r = 0.525, p < 0.001), SEC (r=0.603 p < 0.001), LAA thrombus (r = 8.313, p < 0.001) and AF duration (r =2.877,p= 0.006) and significant negative correlation with LAA emptying velocity (r =-0.530, p <0.001) , filling velocity (r = -0.487, p < 0.001) , and LVEF(r =-0.317 ,p =0.025) .The cut-off value of hs-CRP >4.5 mg/ dl had sensitivity, specificity, positive & negative predictive values and accuracy 95 %, 90.3% ,92.9, 97 and 93% respectively for predicting thromboembolic risk in patients with non valvular AF .



(A) and(B) LAA thrombus detected in a patient with non-valvular AF undergoing transesophageal echo (TOE) before cardioversion.
(C) Spontaneous echo contrast or "smoke" detected by TOE in the LAA and left atrium of a patient in non-valvular AF.

CONCLUSION: High-sensitivity C- reactive protein (hs-CRP) level is suitable to predict thromboembolic markers in patients with non-valvular AF. Therefore, it can help to predict the presence of these markers among AF patients in combination with established clinical risk score (CHA2DS2-VASc score).

KEY WORDS: Thromboembolic risk, hs-CRP, non valvular atrial fibrillation.

Retrograde Trans-Catheter Closure of Perimembranous Ventricular Septal Defect With Amplatzer Duct Occluder II, Tanta University Experience.

J. DeGiovanni, [1] , Sahar El Shedoudy [2]and Eman El-Doklah [2]

Objective: to assess effectiveness and safety of retrograde transarterial approach using Amplatzer Duct Occluder II (ADO II) to close perimembranous ventricular septal defects (pm VSD)

MATERIAL AND METHODS:

10 symptomatic patients with evidence of left ventricular (LV) volume overload were candidate for retrograde approach with ADO II; small VSD size (right ventricular (RV) side less than 6mm) and most of them had small aortic rim. Clinical evaluation, ECG and echocardiographic assessment were done before closure, 6 months and 1 year after closure.

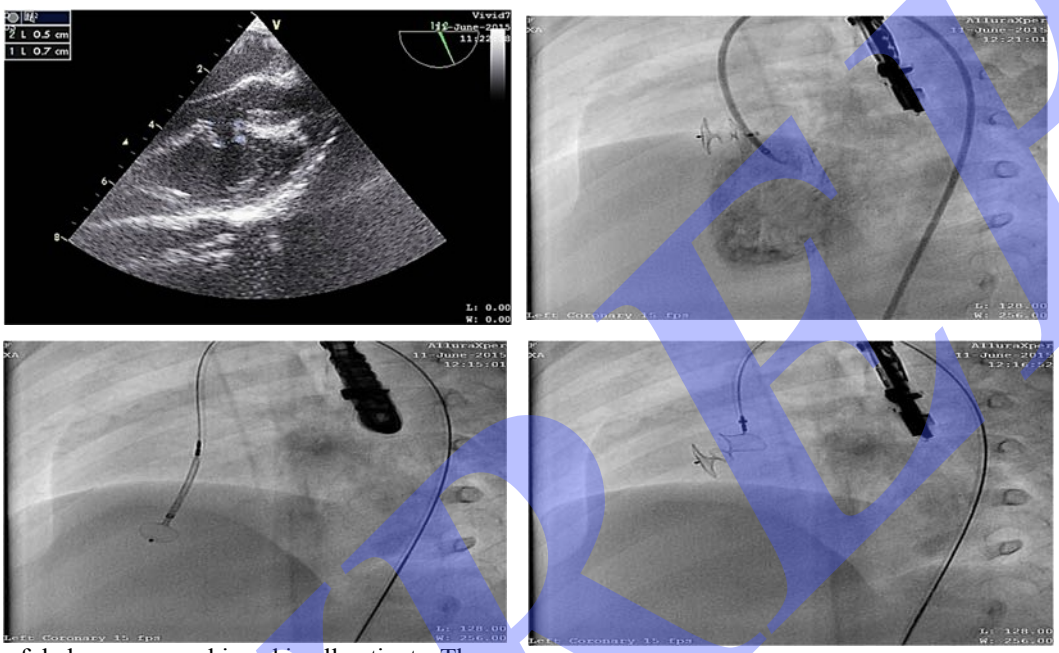
We excluded large VSDs (since the maximum waist diameter of ADO II available is 6mm), aortic incompetence , inlet extension ,malaligned VSD ,contraindication to antiplatelet therapy and irreversible pulmonary vascular disease.

PROCEDURE :

The procedure was done under general anesthesia with TEE guidance.
Arterial and venous access were obtained then full heparinization.
Angiographic visualization of VSD.

The defect was crossed from the arterial side .
Device size was equal to or 1 mm larger than RV side of the defect.
the delivery sheath was introduced from the arterial side.
The RV disc of ADO II was first deployed.
A check injection was then made to confirm the engagement of the RV disc, this was also verified by TEE.
The waist and the LV disc were released inside the aneurysmal tissue .
Once good device position was confirmed, the final step was to release the device.

RESULTS:



Successful closure was achieved in all patients. The mean age was 3.4 ±1.58 years. The mean weight was 14.65 ±3.93 kg. The mean VSD diameter measured with left ventricular angiography was 4.4 ±0.52 mm at its exit. The mean VSD diameter measured with TEE was 4.4 ±0.52 mm. All patients had aneurysmal tissue. Aortic rim was < 3mm in two patients. The mean Qp/Qs was 2.28:1 ±0.20. The mean pulmonary artery pressure was 25± 3.33 mmHg. The mean fluoroscopic time was 15.9 ±1.2 minutes. There were no procedure related complications. Follow up evaluation included ECG, TTE 6 months and one year after procedure. Residual shunt was present in 20% of patients which significantly decreased to 10%, 6 months later. **Conclusion:** Percutaneous retrograde device closure of pmVSD using ADO II device is a simple, safe and time saving technique in selected cases

Reversal of Abnormal Cardiac Parameters Following Mitral Valve Replacement For Severe Mitral Stenosis In Relation To Pulmonary Artery Pressure.

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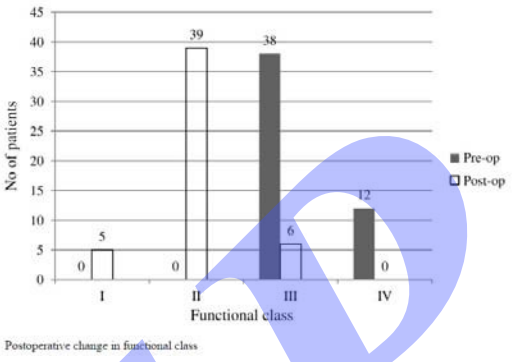
Pulmonary hypertension (PH), an invariable accompaniment of mitral stenosis (MS), varies in incidence reported in different series. Its negative impact in terms of higher operative mortality and morbidity, the brunt of chronic PH leading to right ventricle (RV) failure, and the prognostic implications are well known. However, PH is documented to regress after surgery, the extent of which varies in



Postoperative change in functional class

individuals and over varying postoperative intervals . Though factors determining normalization of PH have been studied, enough attention has not been given to the correlation between PH regression and change in other noninvasive cardiac parameters. This paper is centered on this aspect of degree of pulmonary artery pressures (PAPs) change at discharge, and 1-year postmitral valve replacement (MVR) in relation to clinical disability and cardiac chamber changes, and has attempted to emphasize the difference in relation to the PH grades. Although the regression of pulmonary hypertension (PH) in mitral stenosis (MS) has been studied over varying periods postintervention, corresponding studies on the cardiac chamber alterations after surgery are very limited. We sought to determine the degree of reversal of these and the clinical status in connection with that of pulmonary artery pressures (PAPs) in the early and late postoperative periods.

Right Ventricular Dysfunction Post On-Pump Vs Off-Pump Coronary Artery Bypass Grafting, Is There A Difference?

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Supervised by: Amal Khalifa, MD, Cardiology Consultant at Kasr El-Aini Hospital

Faculty of medicine, Cairo University

Background: The right ventricle (RV) may be selectively impaired following coronary artery bypass graft (CABG).

Introduction:

* CABG surgery is the ttt of choice for CAD in left main stem and MVD.
* ECHO-Doppler and TDI study are in use as quick, accessible and sensitive methods for LV and RV functions assessment prior to and following the CABG surgery.
* Many studies suggest that the LV systolic function is maintained after the Off-(pump machine) CABG and significantly impaired early after On-pump CABG.
* Short-term studies suggest that RV function may be impaired immediately after CABG in both modalities and improved completely within 6 months (Alam M, et al. Am Heart J 2003, Hedman A, et al. J Am Soc Echocardiogr 2004).

Aim of this study:

* To study the impact of significant RCA stenosis on early (within 6 days) and late (6 months) RV dysfunction following CABG.
* To see if the changes in TAPSE or TDI can be explained due to the presence of significant stenosis in the RCA by dividing the CABG cohort into RV ischemic (diseased RCA) and non-ischemic patients.
* To explore the effect of CABG in both modalities on LV systolic and diastolic function, early post operative and 6 months after surgery.

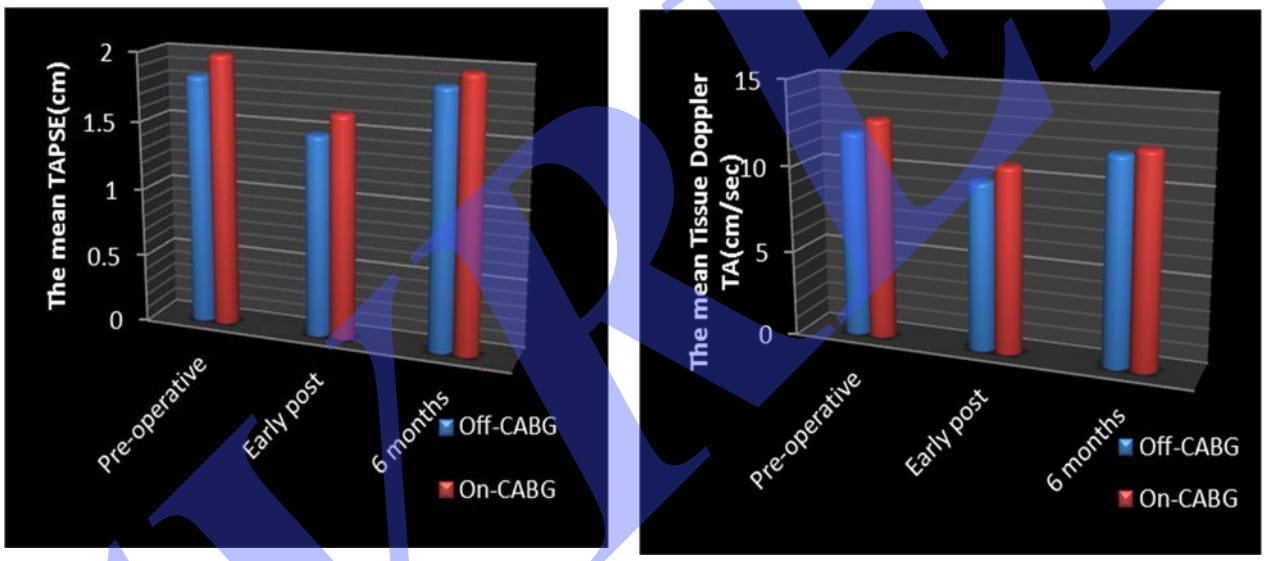
Method:

* Prospectively, we studied two groups of patients.
* Group A (30 patients) had an Off-pump CABG and group B (30 patients) had an On-pump CABG.

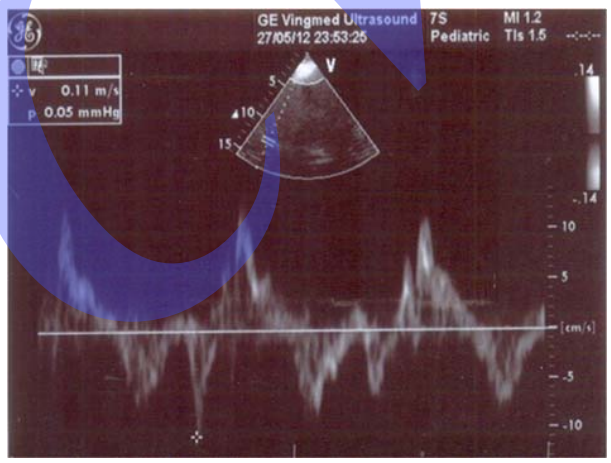
* All patients were subjected to preoperative, early post operative and 6 months follow up, full clinical assessment, ECHO-Doppler study and preoperative diagnostic CA.
* We compared two subgroups of patients, with significant RCA stenosis (25 patients had an off-pump and 16 patients had an on-pump) and another subgroup with normal RCA (5 patients had an off-pump and 14 patients had an on-pump).

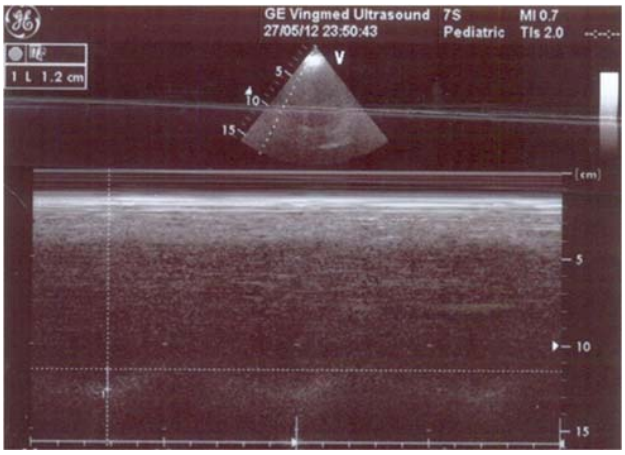
Results:

-All patients in both groups of our study were males.
-The most common presentation was UA in 66% (20) patients in each group.
-The most common affected coronary artery by angiography was the LAD followed by LCX then RCA.
-There was non-significant difference comparing the clinical picture of right side heart failure (RSHF) in both groups.
-Liver congestion and elevated jugular venous pressure (JVP) were noticed in both groups more early post-operative, which were normalized 6 months, below preoperative measures.
-There were no significant differences in ECHO parameters of RV function between the two groups.
- The main parameters in our study for assessment of RV function were TAPSE (Tricuspid annular plane systolic excursion) and TDTA (Tissue Doppler pulsed wave tricuspid annulus systolic velocity).

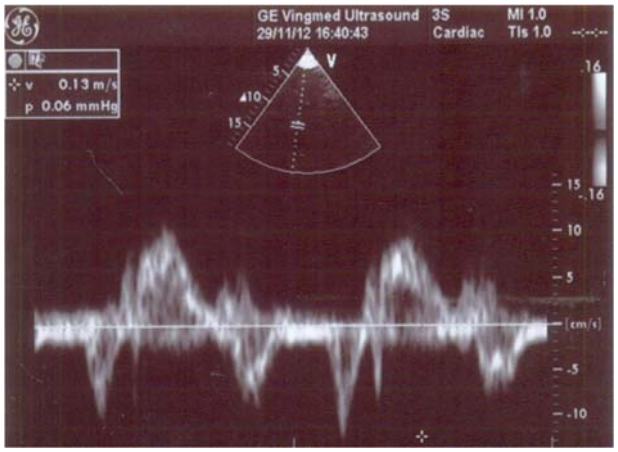


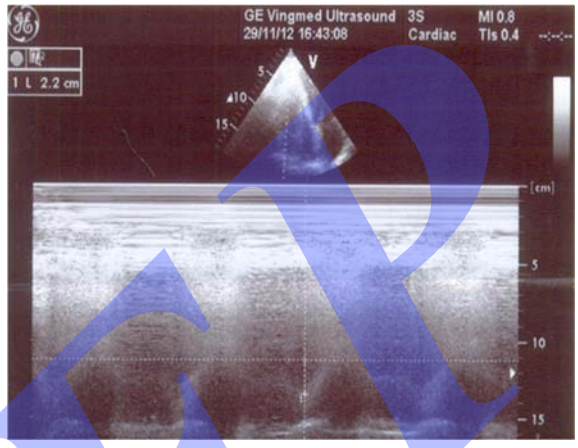
Mean TAPSE (left) and the pulsed wave tissue Doppler (right) measured preoperatively, early post and after 6 months, comparing between both groups.





ECHO-Doppler pictures for TAPSE and TDI early post operative (above) with significant impairment of RV function and 6 months (below) which improved, in group A patients with Off-pump CABG





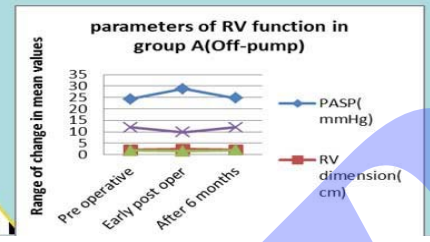
RV function parameters	n	Significant RCA stenosis (RV ischemia, total n=41) Mean pre	Mean post	Absol. change	n	Normal RCA (normal RV function pre op.) total n=19 Mean pre	Mean post	absol change	Test fo r inter- Action P
Absolute change in TAPSE(cm)									0.28(NS)
Off-pump CABG	25	1.7±0.45	1.3±0.55	0.4±0.2	5	2.32±0.35	1.72±0.4	0.6±0.3	
On-pump CABG	16	1.71±0.76	1.4±0.71	0.31±0.05	14	2.32±0.5	1.67±0.45	0.65±0.15	
Absolute change in TDTA(cm/sec)									0.95(NS)
Off-pump CABG	25	11.5±3.01	9.32±2.5	2.2±0.51	5	14.2±0.53	12±1	2.2±0.47	
On-pump CABG	16	11.4±2.01	9.3±3.0	2.1±1.01	14	14.4±1.5	12.4±1.5	2.0	
Absolute change in RV dimen.(cm)									0.35(NS)
Off-pump CABG	25	2.1±1.03	2.24±0.97	0.14±0.06	5	2.02±0.4	2.14±0.3	0.12±0.1	
On-pump CABG	16	2.32±0.7	2.74±0.95	0.42±0.25	14	2.02±0.36	2.19±0.38	0.17±0.02	
Absolute change in PASP(mmHg)									0.051(NS)
Off-pump CABG	25	25.8±12.5	30.8±17.0	5.0±4.5	5	16.2±4.0	18.2±5.1	2.0±1.1	
On-pump CABG	16	33.9±19.0	39.5±19.1	5.6±0.1	14	19.4±8.0	27.8±9.0	8.4±1.02	

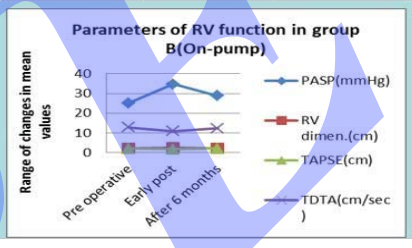
* the RV function parameters early after CABG in patients with and without significant RCA stenosis (RV ischemia) in both modalities of CABG.
* This table explains that both surgical techniques produced equivalent results on RV function with or without significant disease of RCA (RV ischemia).

Results (cont.):

* There were no significant differences in ECHO parameters of RV function between the two groups.
* All results were applied in (mean±SD) as in table (5).

Parameters of RV Function	Group A, Off-pump (n=30) patients				Group B, On-pump (n=30) patients				P bet. groups
	Preop	Post	6 months	P with	Preop	post	6 months	Pwith	
RV (cm)	2.11±1.02	2.30±1.41	2.12±1.4	0.018	2.12±0.98	2.43±0.93	2.23±0.96	0.019	0.071
TAPSE (cm)	1.83±0.70	1.47±0.51	1.87±0.34	0.002	1.99±0.65	1.63±0.49	1.97±0.41	0.001	0.2
TDTA (cm/sec)	11.98±3.0	9.77±1.73	11.90±1.7	0.002	12.83±3.0	10.77±2.1	12.27±1.6	0.001	0.25
PASP (mmHg)	24.2±12.6	28.73±9.9	24.67±8.0	0.022	25.1±20.2	34.7±12.0	28.77±8.7	0.011	0.06





Conclusion:

The RV function significantly impaired early post-operative in both modalities of CABG irrespective to the surgical technique and completely improved to normal after 6 months. Both surgical techniques produced equivalent results on the RV function with or without significant disease of RCA. Off-pump CABG preserved the LV systolic and diastolic functions, and these impaired functions in On-pump CABG significantly improved after 6 months.

Side Branch; a Benign Entity or a Real Storm?

Walid El Awady, Zagazig

This case was a case of multivessel disease (CTO, OM2, RCA) presented by NSTEMI, before revascularization decision revise first graftability of vessel then judge about viability. This pt was small non graftable LAD, even thallium show non viable LAD territory, so decision was PCI to OM &RCA. Assess risk because we are dealing with vessel supplying more than 50% of viable myocardium. In these situation never ignore even small side branch. After stenting of OM2, OM3(which is small branch) get compromised (TIMI I) with heart block development and ST elevation, and secondary pt collapse rapidly crossing sent strut to open it with final kissing and pt reverted to sinus rhythm, and resolution of ST elevation. My home message here: when dealing of myocardium with large area of scar don't ignore even small branches.

Stent Crushing is A Hidden Enemy

Hesham Refaat, MD, Zagazig University, Egypt, Fellow of UCSC, Italy

Case history:

- 54 years old woman.
- The patient had a history of systemic hypertension and dyslipidemia without any history suggestive of previous cardiovascular disorders.
- The patient was complaining from acute retrosternal chest pain of sudden onset, radiating to back and left shoulder.
- She was admitted to the chest pain unit where ECG was done, and showed inverted ST segment inV1-V6 leads with elevation of cardiac troponin levels.
- The patient was diagnosed as a case of non ST elevation myocardial infarction (NSTEMI).
- The patient was then transferred to Cath. Lab., where early coronary angiography was performed.

Coronary angiography:

Significant bifurcation lesion (LAD - D1). We decided to perform OCT-guided PCI

OCT-guided PCI ….. WHY ?

Pre-PCI OCT :

- assess lesion.
- evaluate side branch ostium.

Post-PCI OCT :

- exclude acute complications.
- evaluate the efficacy of PCI.

Pre-PCI OCT :

- OCT evidence of plaque erosion with minute thrombi involving the bifurcation point (LAD–D1).
- MLA : 2.4 mm²
- Lesion length : 25 mm

Coronary angioplasty was performed

- Radial approach.
- 3.5 6F guiding catheter.
- 2 guiding wires in LAD and D1.
- Stenting of LAD. DES (3.0 x 30 mm at 14 atm).
- Rewiring technique.
- Final kissing balloons : LAD & D1 (3 x 20 mm)

OCT findings:

- Severe LAD stent underexpansion(40.43%).
- Marked stent malappositiondistance (1.9 mm) extending for a length of 2.8mm proximal to D1 ostium.
- Asymmetrical stent expansion (SEI=0.48) and crushing of the proximal stent segment within the LAD.
- The stent was CRUSHED !!!

The scenario of "Stent Crushing"

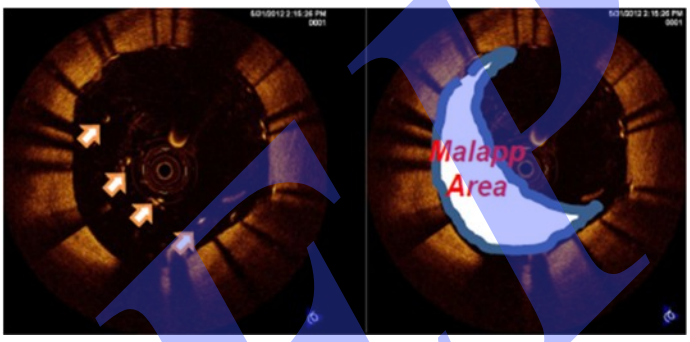
- Wire exchange was done improperly and the wires entered the stent through a side cell instead of entering from the proximal inflow.
- There were Max.malapposition distance (1.9mm) with stent underexpansion (40.43%) and in stent CSA (3.74mm2), resulting in "StentCrushing".
- After passing through a side cell, the wires entered the stented distal segment and follow the proper course.

The plan was …

- Rewiring under OCT guidance.
- The wires had to follow their appropriate path.
- POT using HIRYU NC 3.00 X 15 inflated at 16 atm.
- Post-POT OCT

Post-POT OCT

- Well opposed struts.
- Guiding wiring followed the correct path.
- Mean diameter = 3.2 mm



More proximally

- Well opposed struts.
- Guiding wiring followed the correct path.
- Mean diameter = 3.7 mm

Take Home Messages

- Coronary angiography has a limited value in assessing acute complications resulting from bifurcation stenting.
- Plaque erosion is the underlying culprit lesion among women and NSTEMI patients.
- 3D OCT is valuable in assessing SB ostium, to properly select the bifurcation technique.
- FKB technique and inappropriate wirere crossing may be complicated by stent underexpansion and severe stentmalappositon, and even stent crushing despite achieving acceptable angiographic results.
- 3D OCT is valuable to ensure the correct passage of guide wires through the target main vessel and side branch ostium.
- Distal reference stent sizing = proximal under expansion of the stent. So, POT is needed to complete stent expansion.
- POT facilitate optimal mid-distal SB recrossing.

Stress Echo Beyond Coronary Artery Disease

Professor Michael Henein, Umea University, Sweden, St George University, London

Stress echocardiography is a well established cardiac investigation for the diagnosis of significant coronary artery stenosis, and for confirming the presence of viable myocardium that warrants revascularization. Various modalities can be used including, exercise and bicycle exercise as well as pharmacological stress by dobutamine or dipyridamole, with very high specificity for excluding significant coronary stenosis.

Stress echocardiography has also been applied in patients with valve disease, in particular those with severe aortic stenosis (mean pressure drop >40 mmHg) who claim being asymptomatic as well as symptomatic patients with moderate stenosis severity (peak pressure drop <60 mmHg). Although limited evidence exists, patients with artificial aortic valve who claim exertional symptoms should benefit from stress echocardiography in order to assess valve function and the reproducibility of their symptoms. Worsening ischaemic mitral regurgitation is another application for stress echocardiography, particularly before coronary artery bypass grafting surgery in order to better plan the surgical procedure.

Recently, the evidence for using stress echocardiography in patients with exertional symptoms other than those due to coronary artery disease started to grow. Breathlessness in patients with various degrees of left ventricular

dysfunction can critically be assessed in order to guide towards optimum treatment. Patients with LV restrictive filling who revert to non-restrictive filling pattern may benefit from vasodilation therapy since they have good diastolic myocardial reserve, compared to those with resistant restrictive filling who carry poor prognosis, hence may benefit from an ICD implantation. Also, breathless patients who develop very short filling time (representing compromised stroke volume) at peak stress, should benefit from optimum pacing settings that guarantee physiological stroke volume.

LV Cavity Vs Segmental dyssynchrony for better CRT Response

Heart failure symptoms result mainly from left ventricular (LV) cavity dysfunction. Likewise, conventional medical treatment of heart failure impact the systemic circulation as well as LV cavity. Furthermore, electrical signs of LV dyssynchrony, used to recommend cardiac resynchronysation therapy (CRT), are based on broad QRS duration with/out prolonged PR interval, which reflect the overall LV cavity patterns of depolarization.

Although medical treatment of heart failure has resulted in significant improvement of survival and reduction of hospitalization, a significant number of patients remain symptomatic at mild-moderate exertion, thus compromising their life style. Those who fulfill the guidelines criteria for CRT treatment receive a pacemaker which results in significant improvement of symptoms and survival, but only in 60-70% of patients. The remaining non-responders comprise a clinical dilemma. Investigators in various cardiology disciplines proposed markers for predicting patients who may respond to CRT, using different techniques including echocardiography, CMR and others but with modest accuracy. These attempts aim at identifying the segmental severity of dyssynchrony with/out scarring, in order to achieve optimum pacing and best possible synchronous cavity. However, successful pacing of such segments could be technically challenging.

Only modest evidence exists which supports the potential use of indirect markers of LV cavity dyssynchrony as predictors of good response to CRT. The relationship of LV filling time, ejection time and total isovolumic time has been shown to correlate closely with the stroke volume and cardiac output, at rest and at peak stress, in patients with dilated cardiomyopathy, consequently should be feasibly used in daily management of heart failure patients.

Study of Possible Relation between Maternal Serum Resisting and Insulin Resistance in Patients with Pre-eclampsia

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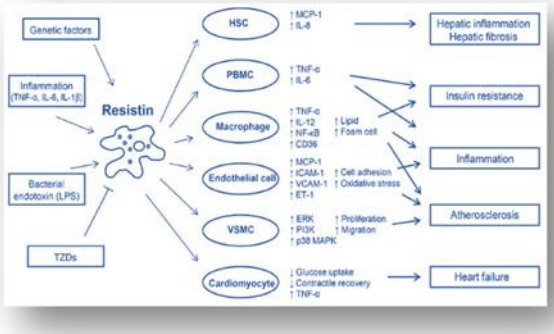
Pre-eclampsia is a multi-system disorder that causes substantial maternal and fetal morbidity and mortality. It is defined as sudden onset of hypertension presenting after the 20th week of gestation (≥ 140/90 mmHg) accompanied by abnormal edema and/or proteinuria.

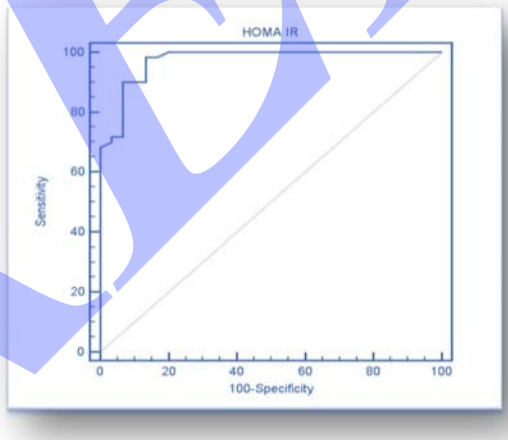
Resistin is one of adipocytokine hormones that are secreted by the adipose tissue and mononuclear cells. Resistin is a potent regulator of glucose homeostasis that is thought to oppose the action of insulin in peripheral tissues.



HOMA describes glucose–insulin homeostasis.The approximating equation for IR uses (fasting blood glucose; FBG) and (fasting insulin; FI) , together with a constant .

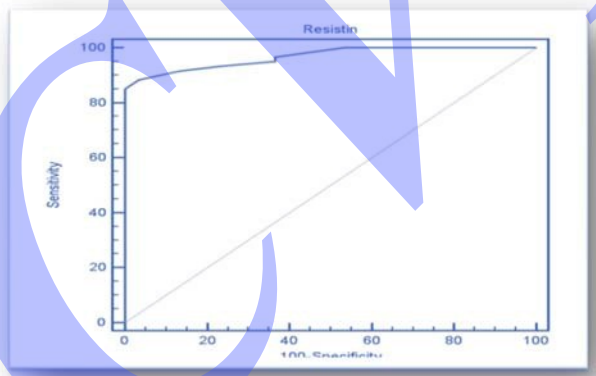
The present study conducted on ninety (90) females. They were divided into the following groups:- Group I (60): Pre-eclampsia Group (PE) and Group II (30): Healthy pregnant Group as control .

Study results revealed a highly statistically significant increase in serum levels of resistin and HOMA-IR in pre-eclamptic women when compared to their matched controls. As resistin plasma concentrations depend on glomerular filtration and increase with progressive renal impairment, altered renal function in PE might contribute to elevated circulating resistin levels.



The elevated serum resistin levels might be associated with exaggerated insulin resistance via the extensive systemic inflammatory response in pre-eclampsia .

Monocyte activation is one of the associated features of systemic inflammation . Monocytes may be the source of the increased serum resistin concentrations in pre-eclampsia. Resistin impairs glucose intake by adipocytes, and increases plasma glucose concentrations, thus decreasing insulin sensitivity .



The best diagnostic cut off level of resistin for discriminating pre-eclamptic patients versus healthy pregnant controls was 10ng/mL. This had a diagnostic sensitivity of 88.33 %, specificity 96.67 % positive predictive value 98.1% and negative predictive value 80.6%.

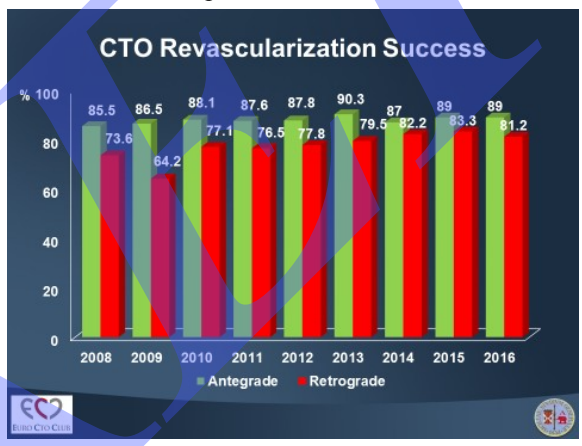
Assessment of the diagnostic performance of HOMA-IR in pre-eclamptic patients versus healthy pregnant controls revealed that the best diagnostic cut off level was 2.05. This had a diagnostic sensitivity 98.3 %, specificity 86.67 % positive predictive value 93.7% and negative predictive value 96.3%.

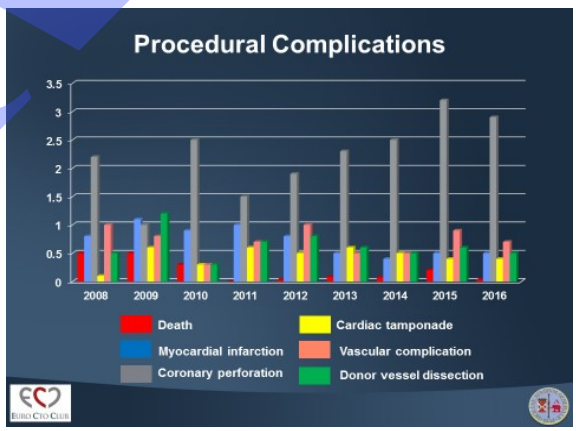
The results of this study demonstrated increased serum resistin concentrations in women with preeclampsia compared to the levels found in women with normal pregnancies. This finding suggests that elevated serum resistin levels may represent the exaggerated insulin resistance in preeclampsia.

The Euro CTO Club, 10 years of experience

Prof. Alfredo R. Galassi, MD, FESC, FACC, FSCAI, Department of Clinical and Experimental Medicine, University of Catania Italy and University Heart Center, University Hospital Zurich, Switzerland, President of the Euro CTO Club, www.alfredogalassi.com

The Euro CTO Club (www.eurocto.eu) was founded on 14 December, 2006 in Paris by Alfredo R. Galassi, Gerald S. Werner, Carlo di Mario, Nicolaus Reifart, George Sianos, Dariusz Dudek, Joachim Buettner, and Hans Bonnier. What started as a small group of physicians interested in chronic total occlusions (CTO) and complex coronary interventions, gradually grew into a larger group of almost 200 dedicated operators, spread among all countries in Europe.





The leitmotiv of joining this club might probably be summarized, from an interview taken with Andreas Gruentzig, in 1985, 2 weeks before his death in an airplane crash, which is reported as follow: *I like to depart with more total closure, and try to learn how to deal with total closures. We did a study on that, and we found out that 70% of the patients who are rejected for dilatation have been patients with total closures in one or the other artery, while having more diseases in the others. Therefore, the total closure is a real problem, if we cannot solve the total closure problem, we probably will never really address the question of multivessel disease dilatation.*The aim of this scientific community is to exchange experience among the most experienced operators in CTO and complex procedures, test new technologies and strategies for CTO recanalization, draw information from a dedicated registry, issue "state of the art" recommendations, promote scientific research and teaching courses. In this respect one important aim of the Club is generally accomplished to teach interventionalists on the problem to accept a CTO lesion, as a lesion like any other lesion in stable angina, but at the same realize that a CTO lesion is not a common lesion, but requires special training to achieve high procedural success. This requires the set up a CTO program, with not more than one or two dedicated operators per each catheterization laboratory. Indeed, following the suggestion of the club, all the "interventional trainees" should have the theoretical knowledge for appropriate patient and lesion selection and the practical experience to avoid the most common mistakes in CTO recanalization. Sufficient training to work as independent primary operator for most angioplasty procedures does not automatically translate into an ability to approach any CTOs, and the minimal number of 75 CTOs per year to maintain competency, translates into a model where only a limited number of operators and centres should perform CTO treatment safely based on workload, monitored success and complication rates. Recommendations for the practice in this field, from the club, are published in a consensus format every 5 years.

The Club is involved in planning the development of training curricula for complex PCI interventions for workshops and courses held in different centers, which might give opportunities to the fellow to learn about tips and tricks of this specialty in complex interventions.

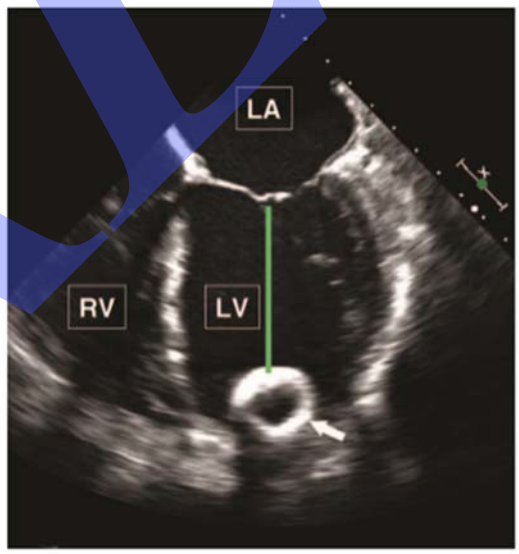
Finally the Euro CTO Club, fosters close collaboration with ESC, EURO-PCR, TCT, SCAI all of them on a personal level of many expert active in their constituent bodies.

The Role of Echocardiography in patients with LVAD

Kerolos Wagdy, AHC

Heart failure is major growing health problem. Patients with advanced heart failure refractory to medical treatment or cardiogenic shock dependant on inotropes are indicated for mechanical circulatory support or heart transplantation. Left ventricular assist device (LVAD) is long term mechanical circulatory support that may be bridge to transplantation, destination therapy or bridge to recovery. With its advances and success the number of LVAD markedly increased. It improves quality of life and end organs function.

LVAD consists of the inflow cannula which is implanted into the apex of the LV and takes blood to device, LVAD pump that pushes blood to ascending aorta via outflow graft. The pump is connected to controller (outside the body) by driveline.



Echocardiography is a golden tool for different phases of care of patients with LVADs. Firstly echo has integral role in **preoperative assessment** of candidates in assessment of ventricular structure and function, hemodynamics and valvular function. **Perioperative evaluation** by transoesophageal echocardiography in screening for intracardiac shunts, assessing the position of inflow cannula, examining the aortic root for aneurysm or atheroma, detecting right ventricular failure (RV) or pericardial effusion.

Post implantation follow up includes LV internal dimensions and function; 2D parasternal long-axis image is considered the most reproducible measure (ECG gated for timing). LV volumes Simpson's method reflect the LV size more accurately than do linear measurements but technically challenging to obtain after LVAD implantation because of apical shadowing. Comparing the LV dimensions and function with preimplant values is important to assess unloading and native ventricle recovery. Speckle tracking derived LV strain has role in assessment the improvement of ventricle via circumferential strain readings. Additionally, assessment of aortic valve is critical part in examination, assessing the extent of opening (completely, partially or doesn't open) and its timing (every beat, every other beat, every two beats, etc.) AV opening is affected by; LVAD speed, native LV function, volume status and systemic vascular resistance.

Complications and VAD dysfunction: the echo can detect a lot of complications e.g. RV failure, pericardial effusion with or without tamponade, hypovolemia, malposiition of inflow cannula, pump thrombosis, inflow cannula masses (thrombus or vegetation) and outflow obstruction.

Recovery: It's well established that; some cases with LVAD showed improvement of LV contractility after unloading the ventricle and LVAD could be stopped and explanted. Echocardiography has plays major role in serial assessment of improvement and all recovery protocols.

The Year in Cardiology 2016: Heart Failure

Prof. Mahmoud Hassanein- Alexandria

The most important novel recommendations of the 2016 ESC guidelines on diagnosis and treatment of HF can be summarized in the following points: A novel algorithm for the diagnosis of HF in the non-acute setting. The use of natriuretic peptides (NPs), their measure is recommended as a first step in all patients with suspected HF. The role of NP levels is mainly for excluding HF, due to their very high negative predictive value. Transthoracic echocardiography is mainly used to stratify the patients with chronic HF in: reduced (heart failure reduced ejection fraction (HFrEF) LVEF <40%), mid-range (HFmrEF, LVEF: 40-49%) preserved ejection fraction (HFpEF, LVEF >_50%). A revised algorhytm for the treatment of patients with chronic HF has been proposed. All patients with symptomatic HFrEF should receive a combination of an Angiotensin-converting enzyme (ACE)-I [or Angiotensin receptor blocker (ARB) if ACE-I not tolerated], a b-blocker and a mineralocorticoid antagonist (MRA). If a patient still remains symptomatic sacubitril/valsartan is recommended to replace ACE-I.

With respect to hyperkalaemia (>6.0mmol/L), besides the shortterm cessation of potassium-retaining agents and renin angiotensin aldosterone system (RAAS) inhibitors which should be carefully reintroduced (as soon as potassium levels are under control), two new potassium binders (patiromer and sodium zirconium cyclosilicate) are currently under consideration for regulatory approval

The ATMOSPHERE trial tested whether combining the renin inhibitor aliskiren with the ACE inhibitor enalapril was superior to enalapril alone and whether aliskiren alone was at least non-inferior to enalapril in patients with HFrEF. The trial showed that the addition of aliskiren to enalapril did not result in a reduction of the risk of death from cardiovascular causes or hospitalization due to HF, as compared with enalapril alone, but did cause more hypotension, renal dysfunction, and hyperkalaemia.

In a randomized controlled trial, the DANISH trial, 18,19556 patients with symptomatic systolic HF (LVEF, <_35%) not caused by coronary artery disease were assigned to receive an implantable cardioverter-defibrillator (ICD), and 560 patients were assigned to receive usual clinical care (control group). In both groups, 58% of the patients received cardiac resynchronization therapy. The primary outcome of the trial was death from any cause. After a median follow-up period of 67.6 months, the primary outcome had occurred in 120 patients (21.6%) in the ICD group and in 131 patients (23.4%) in the control group [hazard ratio (HR), 0.87; 95% confidence interval (CI), 0.68–1.12; P = 0.28]. The conclusion was that ICD implantation for primary prevention in patients with HFrEF, not caused by coronary artery disease, did not reduce the rate of long-term all-cause mortality.

In the SPRINT trial, 9361 subjects with a SBP of 130mm Hg or higher and an increased cardiovascular risk, but without diabetes, had been randomly assigned to a SBP target of less than 120mm Hg (intensive treatment) or a target of less than 140mm Hg (standard treatment). The primary composite outcome was myocardial infarction, other acute coronary syndromes, stroke, HF, or death from cardiovascular causes. The trial was stopped early after a median follow-up of 3.26 years due to a significantly lower rate of the primary composite outcome in the intensive-treatment group than in the standard-treatment group (1.65% per year vs. 2.19% per year; HR with intensive treatment, 0.75; 95% CI, 0.64–0.89; P< 0.001). Regarding, more specifically, the occurrence of HF, in patients allocated to the

intensive harm, HF occurred in 62 (1.3%) cases vs. 100 (2.1%) in the usual care group (HR 0.62, 95% CI 0.45–0.84, P = 0.002). This beneficial effect was obtained in a context of an increase of serious adverse events such hypotension, syncope, electrolyte abnormalities, and acute kidney injury or failure, but not of injurious falls

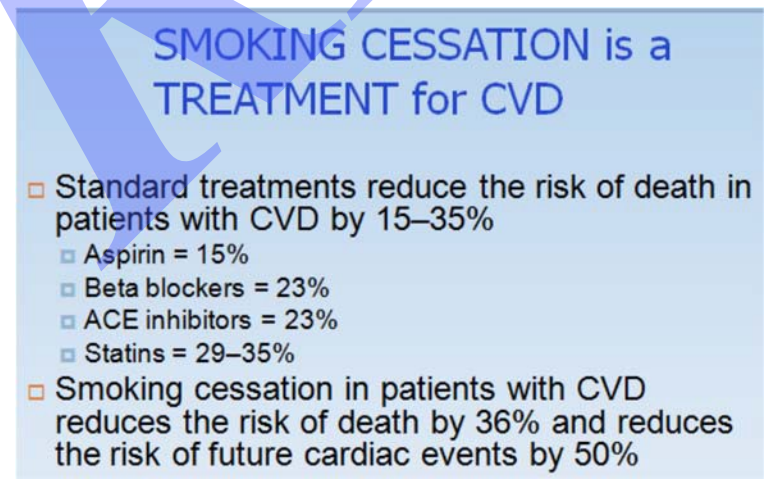
EMPA-REG Outcome trial: Empagliflozin, an inhibitor of sodium-glucose cotransporter 2, has been shown to be able to reduce the rate of hospitalizations for HF in patients with diabetes at high-cardiovascular risk, including patients with HF. Empagliflozin demonstrated a statistically significant 35% reduction in heart failure vs placebo As with the composite primary endpoint results, the heart failure benefit emerged very early in the empagliflozin-treated cohorts.

TRUE-AHF: TRUE-AHF (Trial of Ularitide Efficacy and Safety in Acute Heart Failure) was designed to evaluate the effect of a 48-h infusion of ularitide on the short-term clinical course of patients and the long-term risk of cardiovascular death. The HR for the co-primary end point, cardiovascular mortality, for ularitide vs placebo over a median followup of 27 months was 1.03 (95% CI 0.85–1.25, P=0.75). These results question the concept that early (and short-term) intervention with a vasodilator could reduce wall stress and myocardial injury during the critical initial period of acute HF and therefore that an early treatment is able to decrease the long-term risk of cardiovascular death.

Tobacco Dependence Treatment Training– Egypt

Dr Wael Safwat, Consultant of Internal Medicine and smoking cessation – Wadi Elneel hospital, Certified smoking cessation specialist – Mayo clinic

Tobacco epidemic is growing fast in Egypt and exposure to second-hand smoke is a significant health problem in Egypt. It is one of the major risk factors for cardiovascular disease. Egypt conducted several efforts on Tobacco control and healthcare providers have a major role on that. It is important to know information in all conferences and settings on the size of the problem and how we can provide help to smokers to quit. In addition there is new concepts and trends in smoking like Waterpipe and e cigarettes which we have limited knowledge on it. One of the main strategies for Tobacco control is smoking cessation and providing help to smokers. This objective is severely limited due to lack of resources, capacity and systematic strategies. Training on tobacco dependence treatment will increase the outcome of your management of cardiovascular disease.

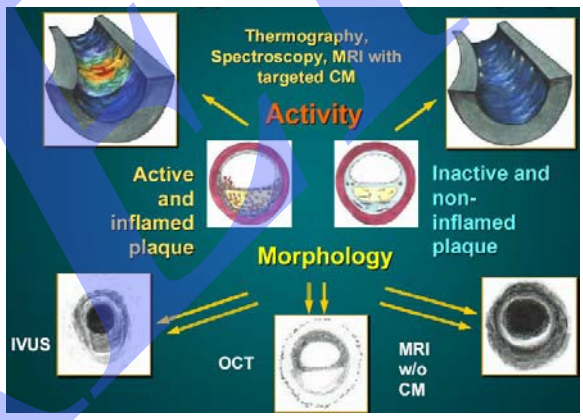


To increase the technical capacity of participants for effective development of smoking cessation and cardio prevention services. We will understand the concept, needs and goals of a smoking cessation medications, know more information about new trends of smoking like E cigarettes and waterpipe, know some of the health hazards of tobacco and gains of quitting, The Biology of Nicotine Dependence , Counseling Theory and Practice, Pharmacotherapy for Treatment of Nicotine Dependence, Challenges of waterpipe dependence interventions and E cigarette.

Vulnerable Plaque Assessment ... Should I Stay or Should I Go....

ELSayed Farag MD, FSCAI, Zagazig University

Criteria for plaque vulnerability:
Major criteria
. Active inflammation (monocyte/macrophage and sometimes T-cell infiltration)
. Thin cap with large lipid core
. Endothelial denudation with superficial platelet aggregation.
. Fissured plaque
. Stenosis 90%



Minor criteria
. Superficial calcified nodule
. Glistening yellow
. Intraplaque hemorrhage
. Endothelial dysfunction

Markers of vulnerability:

- **Activity/Function**

. Plaque inflammation (macrophage density, rate of monocyte infiltration and density of activated T cell)
. Endothelial denudation or dysfunction (local NO production, anti-/procoagulation properties of the endothelium)
. Plaque oxidative stress
. Superficial platelet aggregation and fibrin deposition (residual mural thrombus)
. Rate of apoptosis (apoptosis protein markers, coronary microsatellite, etc)
. Angiogenesis, leaking vasa vasorum, and intraplaque hemorrhage
. Matrix-digesting enzyme activity in the cap (MMPs 2, 3, 9, etc)
. Certain microbial antigens (eg, HSP60, *C. pneumoniae*).

- **Plaque**

Morphology/Structure
. Plaque cap thickness
. Plaque lipid core size
. Plaque stenosis (luminal narrowing)
. Remodeling (expansive vs constrictive remodeling)
. Color (yellow, glistening yellow, red, etc)
. Collagen content versus lipid content, mechanical stability (stiffness and elasticity)
. Calcification burden and pattern (nodule vs scattered, superficial vs deep, etc)
. Shear stress (flow pattern throughout the coronary artery).

Pan-Arterial
. Transcoronary gradient of serum markers of vulnerability
. Total coronary calcium burden
. Total coronary vasoreactivity (endothelial function)
. Total arterial burden of plaque including peripheral (eg, carotid IMT).

By assessing the plaque vulnerability, we may be able to tailor the strategy of treatment and estimate the risk of the occurrence of acute coronary events.