Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

ISICAM 2020
Indonesian Society of Interventional Cardiology Annual Meeting
27-29 NOV '20
THE DIGITAL EXPERIENCE

Abstracts: Case Reports

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

A 18 Years Old Woman With Trans Catheter Closure Of Ventricular Septal Defect Perimembranous Under Transesophageal Echocardiography Guidance

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Background : Transcatheter device closure of perimembranous ventricular septal defects (PmVSDs), under fluoroscopy is a minimally invasive technique, but may result in high radiation exposure. A new method for transcatheter VSD closure under the guidance of Transesophageal echocardiography (TEE) alone was discovered to overcome the radiation risk . We reported the first transcatheter pmVSD closure guided by TEE in Haji Adam Malik Hospital Medan.
Case illustrations: A 19-year- old female was admitted to RSUP H. Adam Malik with chief complain easily fatigue since one month before admission. The Patient was diagnosed pmVSD 7 mm with L-R shunt and severe tricuspid regurgitation with high probability of pulmonary hypertension by transthoracic echocardiography examination . Before the procedure, patient underwent swab test for RT-PCR Sars-CoV-2 as requirements during Covid-19 periode in our hospital, chest X ray and ECG examination. The TEE procedure was done at the catheterization laboratory under general anesthesia. From TEE we found pmVSD and membranous septal aneurysm (MSA). The defect was closed using MFO (Lifetech) VSD Occluder no. 10/8, the MP catheter size 6F from FEAR went to Aorta and straight to LV crossing and pushed to RV. Guided by TEE, the delivery sheath 14F was positioned, the device was inserted and placed at the defect. The device was well fixated and there was found mild tricuspid regurgitation and minimal central residual at the device and the device was released. The procedure was finished with no significant problem.
Conclusion: Transcatheter closure of pmVSD guided by TEE was feasible and effective procedure

Keywords: pmVSD, transcatheter device closure, echocardiography, TEE

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

A 24 Years Old Man With Transcatheter Closure Ruptured Sinus Of Valsalva Under Transoesophageal Echocardiography And Flouroscopy Guidance

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Background: Ruptured of sinus Valsalva (ROSV) is a rare disease. Ruptured into other cardiac chamber, pericardial space or extra cardiac may be spontaneous or triggered by trauma, extreme physical exercise or endocarditis. A large rupture can lead to a sudden volume overload and pulmonary oedema but smaller can result progressive volume overload with gradual onset of symptoms including shortness of breath, palpitations, chest pain, fatigue and syncope[4,5]. Our case reports is a case of SVA rupture into right ventricle.
Case Illustrations: In this case report, we report 24 years old man with easily fatigue and shortness of breath as chief complains for last 2 months. From examination in ward, we found a continuous machinery cardiac murmur. Transthoracal echocardiography demonstrated ventricular septal defect sub-pulmonic typed but transoesophageal and cardiac catherization did not demonstrate any ventricular septal defect and we found ruptured sinus of Valsalva. We plan to close the defect with transcatheter method with device guided by transoesophageal echocardiography and fluoroscopy. Device was deployed and intervention was done successfully with minimal central residual shunt.
Conclusions: Clinical history with sudden heart failure symptom (shortness of breath, easily fatigue, pulmonary oedema or peripheral oedema) with new continuous murmur finding in physical examination is the key to diagnose patients with rupture of sinus Valsalva. Further Echocardiography and cardiac catherization are key to diagnose this disease. Although surgery is still gold standard therapy for this disease, percutaneous transcatheter closure can be an alternative therapy with similar efficacious and fewer complications
Keywords: transcatheter, ruptured sinus of Valsalva, transesophageal echocardiography, fluoroscopy

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

A 51 Year-Old Man with Coronary Artery Aneurysm Presenting as Non ST Elevation Myocardial Infarction

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Background: Coronary artery aneurysms (CAA) are rare case. Aneurysmal dilation of coronary arteries is observed in up to 5% of patients undergoing coronary angiography. Atherosclerosis is the commonest cause of this disease in adults. Most patients are asymptomatic, if there is a symptom mostly presenting with acute coronary syndrome. Coronary artery aneurysm can result worse outcome in patient present with acute myocardial infarction. There are no randomized control trials to guide the therapy at this moment. The options of management strategy are medical therapy, percutaneous coronary intervention (PCI) and surgical. Due to lack of the recommendation in treating this condition, clinicians will face a challenging situation when get this patient in acute coronary syndrome setting
Case illustrations: A 51 year-old male with medical past history hypertension and smoker who come with typical chest pain and history of cardiac arrest (ventricular tachycardia/fibrillation) in previous hospital. Hemodynamic was stable in emergency room. The ECG showed inverted T wave in inferior lead and hyperacute T in V2-V3. The cardiac troponin was elevated. We decided to activate catheterization laboratory due to very high risk stratification. The coronary angiography revealed ectatic coronary artery and aneurysmal dilatations.
Conclusions: Coronary artery aneurysm is rare case. In setting of acute coronary syndrome, out goal is to get TIMI II-III flow in culprit artery. Before perform intervention in CAA case, we have to consider several factors including symptomatic or asymptomatic patient, CAA related intervention or non-related, type and location of CAA in coronary artery, for those with giant CAA, CAA in LM, at bifurcation, complication CAA, progressive enlargement of CAA, we may consider to surgical management. PCI with PTFE covered stent can be performed in saccular CAA in main coronary not involving a major side branch. If CAA is involving a major side branch, perform PCI with stent-assisted coil embolization or proceed to surgical intervention
Keywords: coronary artery aneurysm (CAA), coronary angiography, PCI.

Indonesian Journal of Cardiology
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doi: 10.30701/ijc.1088

A Case Report Of Inferior Transient ST-Elevation Myocardial Infarction: Bezold-Jarisch Reflex Revisited

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Background: A frequently forgotten counterpart of inferoposterior acute myocardial infarction (AMI) is the Bezold-Jarisch Reflex (BJR), whose stimulation of these vagally mediated receptors can increase parasympathetic activity and inhibit sympathetic activity, manifesting in bradycardia and hypotension. In addition, the management of complete resolution of symptoms and ST-segment elevation in AMI is still unclear to be considered as ST-elevation myocardial infarction (STEMI) or non-ST-elevation myocardial infarction (NSTEMI).

Case illustrations: We report a 60-years man with a chief complaint of squeezing epigastric pain radiating to the mid-chest and waist accompanied by nausea-vomiting, bradycardia, and hypotension. The pain was resolved without any intervention at the time of admission, but an hour later, the pain has re-emerged with similar symptoms. An electrocardiograph (ECG) was recorded for any changes in pain symptoms. There was ST-segment elevation in the inferior leads when the pain re-emerged, but the ECG showed complete resolution of the ST-segment elevation a few minutes after the pain subsided. Blood tests showed elevated levels of Troponin-I, and the patient was diagnosed with transient STEMI. Coronary angiography revealed significant tight stenosis at the right coronary artery (RCA), and a drug-eluting stent was placed in the culprit lesion.

Conclusion: Transient STEMI and BJR with its complex pathophysiological mechanisms are still not clearly known, but emergency doctors must make a timely clinical decision based on the evolution of the clinical signs and symptoms in cardiovascular emergencies.

Keywords: Bezold-Jarisch reflex, transient ST-elevation myocardial infarction, case repot

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

A Hemoptysis Following A PDA Closure: Should It Be Worried?

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Background: Patent ductus arteriosus (PDA) is a rare diagnosis in adults, since symptoms and signs usually occur in infancy and most cases are treated shortly after diagnosis. Transcatheter closure has been established to be the method of choice for treating a PDA in adults.
Case presentation: A 24-year-old female with a chief complaint of shortness of breath for at least 2 months following a device closure for PDA. On March 2019 she had a successful percutaneous device closure (Occluder No.12). Echocardiographic imaging showed an in situ device with a minimal residual shunt. Three months later, she presented symptom of hemoptysis which suspected as a Tuberculosis. Mandatory examination for her cough and sputum was done but resulted nothing. Six months of her symptom, echocardiographic was performed and found a residual PDA shunt without device in situ. Multislices cardiac CT-scan showed PDA device embolize to the left lung with sign of infarction. An attempt was perform to evacuate the embolize device but failed. Another closure for the existing shunt was done using larger device closure (Occluder No.16). The embolize device was evacuated surgically followed by segmental lobectomy to evacuate it.
Conclusions: Hemoptysis may be an important sign of device embolization to the pulmonary artery following a device closure in a patient whose doesn't have a sign of pulmonary arterial hypertension. An unwanted residual sign shoud be a warning sign to evaluate a device closure.
Keywords: hemoptysis, PDA, closure

Indonesian Journal of Cardiology
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A Transcatheter Closure With Transesophageal Echocardiography Guidance On A 29 Year Old Woman With Secundum Atrial Septal Defects With Double Atrial Septum With Malaligment: A Case Report

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Background: Secundum atrial septal defect is the most common type of ASD and it is about 50-70% cases of all ASDs. Trascatheter closure has become the first choice for secundum defect closure. Since the risk of radiation exposure from the fluoroscopy has gain increasing awareness, transcatheter closure guided by transesophageal echocardiography (TEE) has became an alternative to the fluoroscopy guidance. The spectrum of anatomic variation is relatively high in ASD which can be found by TEE such as deficient rims, altered septal geometry in the form of malalignment, and even the double atrial septum which was an extremely rare atrial septal anomaly. All of these abnormalities can influence the outcome of the transcatheter closure procedure. Herein, we present a case of transcatheter closure of secundum ASD with double atrial septum with malalignment under transesophageal echocardiographic guidance (without fluoroscopy).
Case illustrations: We report a 29 year-old-woman with easily fatigue and shortness of breath as chief complain. On physical examination, we found a widely split and fixed S2. From the TTE we found secundum atrial septal defect with left to right shunt. The patient also underwent TEE before the ASD closure procedure and then we found there was secundum atrial septal defect with double atrial septum with malalignment. And then we planned to close the defect and approximate the double atrial septum using catheter-based device occluder. Device was deployed and intervention was successfully done with no residual shunt.
C**onclusions**: The success of percutaneous closure of ASD is directly related to the proper selection of the patients for implantation. The detailed study of the defect and the other morphologic abnormalities can be performed in a precise way through TEE.
Keywords: secundum atrial septal defect, double atrium septum, percutaneous closure

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Amplatzer Ductal Occluder In 15 Month-Old Children With Patent Ductus Arteriousus (PDA)

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Background: Patent ductus arteriosus (PDA) is one of the most common congenital heart defects, accounting for 5%–10% of all congenital heart disease in term infants. The maintenance of ductal patency is essential for the normal development of the fetus. In the neonate, however, persistent patency of the ductus arteriosus (DA) is associated with significant morbidity and mortality. Closure of PDA is indicated in all cases, except for duct-dependent congenital heart diseases or PDA with Eisenmenger syndrome. In recent years, interventional cardiology has become a gold standard therapy for the majority of PDA cases beyond neonatal age[2]. The ADO device was designed to provide the most desirable characteristics for a percutaneous closure device that can be used in most if not all patients with PDA.
Case illustrations: A 15 month-old (8 kg) presented with a moderate- or large-sized patent ductus arteriosus (PDA). The patient had complaint recurrent of cough for 2 months and poor growth. There is no abnormalities during pregnancy. Echocardiography showed LA and LV dilatation, Moderate PDA (4.4 mm) with L-R shunt. The patient was planned for ADO I
Conclusions: In this case report study, the Amplatzer Duct Occluder was safe and effective for closure of moderate-or large-sized PDAs without pulmonal hypertension in 15 months-old children. There is no complication in this patient.

Indonesian Journal of Cardiology
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pISSN: 0126-3773 / eISSN: 2620-4762
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Anomalous of the Right Coronary Artery from the Opposite Sinus (R-ACAOS) Presenting as ST Elevation Myocardial Infarction (STEMI)

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Background: Anomalous coronary artery from the opposite sinus (ACAOS) is a rare congenital anomaly that can present with symptoms similar to coronary artery disease and sudden cardiac death. Management of anomalous coronary artery from the opposite sinus varies; however, current guidelines suggest surgery in symptomatic patients.
Case illustrations: We reported a case of right ACAOS with interarterial course in older aged male with acute coronary syndrome. He initially complained of chest pain with ST segment elevation at inferior leads and high cardiac enzyme thus we diagnosed as Inferior and right ST elevation myocardial Infarction (STEMI). Patients underwent a Primary percutaneous coronary intervention (PCI) showed that he had anomalous of right coronary artery (RCA) with total occlusion of the proximal of it. Stent then implanted at proximal of RCA and patient didn't complained any chest pain anymore. Further work-up revealed that he had right ACAOS with interarterial course and the Stent is implanted at the distal of interarterial course.
Conclusions: A timely diagnosis of an anomalous coronary artery is critical in symptomatic patients because of the risk of sudden cardiac death, especially in patients with arteries with an interarterial course. Right ACAOS with interarterial course that presents as STEMI is a rare case, that management of the STEMI is very important to determine the clinical course of the ACAOS. Anatomic and physiological evaluation should be performed in patients with anomalous aortic origin of the right coronary from the left sinus. Treatment of coronary artery anomalies is controversial and dependent on the discovered anatomy. Surgery is the mainstay of treatment, though beta-blockers and calcium channel blockers have been utilized to lessen ischemic symptoms
Keywords: R-ACAOS, ST Elevation Myocardial Infarction (STEMI)

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Atrial Septal Defect with Severe Pulmonary Hypertension: Long Term Outcomes of Closure with Fenestrated Device

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Background: Pulmonary hypertension (PH) was observed in 8% to 10% of all atrial septal defect (ASD) patients. Complete closure of ASD in these patients could be detrimental due to the potential risk for increase in pulmonary vascular resistance (PVR). The recent ESC guidelines stated that ASD closure is not recommended in patients with PAH and PVR ≥ 5 WU despite targeted PAH treatment (Class III). We reported two serial cases of ASD with severe PH with PVR ≥ 5 WU despite targeted PAH treatment. Fenestrated closure allows for controlled residual shunt providing adequate cardiac output with a mechanism for decompression in the event of critical increase in PVR. Long term follow up showed symptomatic improvement was observed in both of the patients with reduction in New York Heart Association (NYHA) class and reduction in systolic pulmonary arterial pressure. No other major complications were observed.
Case illustrations: there were 2 cases of ASD with severe pulmonary hypertension closed with fenestrated ASD device closure. Those patient had better NYHA class functional and sPAP.
Conclusions: Even in patients with severe PH, using the fenestrated ASD device was beneficial for patients without any major device-related complications. The fenestrated device restricts left-to-right shunting but allows for decompression of the right heart during pulmonary hypertensive crisis.
Keywords: Atrial septal defect, pulmonary hypertension, fenestrated device

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Atypical Presentation of Wellens' Syndrome

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Background: Wellens' syndrome is a specific pattern of T-wave on electrocardiogram which associated with critical stenosis in the proximal left anterior descending coronary artery. Typically this type of pattern will show normal or slightly elevated cardiac enzyme. It is important for clinician to sent this patient for immediate coronary angiography, regarding the risk of extensive anterior wall myocardial infarction.
Case illustrations: We described a female patient admitted to emergency department with angina and showing Wellens' syndrome pattern on ECG with an atypical presentation on coronary angiography. We found the critical stenosis in mid-distal left anterior descending coronary artery. This patient was successfully underwent angioplasty and drug eluting stent placement. The follow-up ECG shows normalization on precordial leads.
Conclusions: It is important to recognizing Wellens' sign on initial ECG in emergency department or in outpatient clinic. Immediate coronary angiography have important role in preventing further coronary occlusion (high risk massive anterior wall infarction). Typical presentation of Wellens' syndrome is a critical occlusion in proximal part of LAD, but several studies shows some variation in the location of the occlusion. In this case report, we found the critical stenosis in mid-distal part of LAD.
Keywords: wellen syndrome

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Balloon Angioplasty In Native Coarctatio Aorta Correlates To Left Ventricular Function : How Successful Is Successful?

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Background: Balloon angioplasty (BA) is an alternative to surgical repair for coarctation of the aorta (CoA) in children and remains controversial.
Case illustrations: We report 2 serial cases of severe coarctation aorta in 5-year old-boy weighing 15 kg with normal function-left ventricular hypertrophy and 12-year-old girl weighing 24 kg with severe dilatation left ventricle (LV) and low systolic LV function. The diameters of the balloons range from 10 to 14 mm, and the gradient decreased significantly. There were no significant complications. The follow up symptom and echocardiography showed improvement, initial hypertension also turned to normal blood pressure.
Conclusions: We conclude that the balloon angioplasty is safe in the treatment of severe coarctatio aorta with good results.
Keywords: *Coarctation of aorta, balloon angioplasty, children*

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Balloon snapped during bifurcation PCI: Choices of retrieval method for broken shaft

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Background: Percutaneous Coronary Intervention (PCI) procedures complicated with broken fragments of angioplasty hardware are rare. Poor decision making in retrieving broken shafts may lead to disastrous condition. Various methods for retrieving broken shafts of coronary hardware had been reported in multiple publication previously.
Case illustrations: In this case report, we present a PCI procedure of a bifurcated lesion in a 61-years-old male. Despite careful attempt to pass the stent inside guiding catheter, it was entangled at the joint of balloon delivery-catheter from the neighboring system. The balloon delivery-catheter snapped when both system was trying to be extracted from guiding catheter. It floated helplessly inside guiding catheter even though its proximal counterpart was being maneuvered. Finally, all system was extracted overall while inside guiding catheter. There was no broken shaft left in the patient's circulation.
Conclusions: The possibility of balloon entrapment should be acknowledged by PCI operators. PCI operators should also be familiar with various retrieval methods of broken fragments or shafts during complex procedures.
Keywords: balloon, PCI, broken shaft

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Cardiac Hemangioma: The Rule of Coronary Angiography

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Background: Cardiac hemangioma (CH) is a rare form of cardiac tumor, with the incidence approximately 1-2% of all primary cardiac tumor. Clinical manifestation varies depending on the location, size, growth rate, and invasiveness of the tumor. Diagnostic tools include echocardiography, coronary angiography, and cardiac imaging.
Case illustrations: We described a case of adolescent male with suspicion of cardiac mass. During trans oesophageal (TEE) and trans thoracal echocardiography (TTE) examination, we found encapsulated extracardiac mass with vascularization. We performed coronary angiography and found hemangioma with right coronary artery (RCA) as feeding artery.
Conclusions: Coronary angiography is useful for diagnosing the disease as it would give insight into the type of cardiac mass.
Keywords: Cardiac hemangioma, coronary angiography

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Cardioembolic Stroke in a Young Male with Patent Foramen Ovale Presenting Motoric Aphasia

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Background: Patent foramen ovale (PFO) is observed in 25% of the general population; 46% of cryptogenic ischemic strokes are associated with its presence. Diagnostic examinations focusing on PFO are recommended in all patients following a neurological incident before the age of 55. The standard examination performed to detect or exclude PFO is transesophageal echocardiography (TEE) using contrast and the Valsalva maneuver.
Case Illustration: A 34-year-old young man with no prior medical history of hypertension nor dislipidemia admitted to hospital after 3 days presentation of onset weakness (right hemiparesis) and motoric aphasia. Brain CT Scan showed hypodense lesion in the left fronto-temporoparietal as a left medial cerebral artery (Left MCA) corresponding with an embolic stroke and occlusions. Aspirin tablet and neurotropic drugs were given. Echocardiography (TTE), micro-bubble test and transesophageal echo (TEE) revealed PFO grade 4/4, without any abnormalities on his laboratory blood coagulation and factors deficiency. PFO closure thru trans-catheter intervention was performed successfully after 6 months of his presentation.
Conclusions: Paradoxical embolism as one of the complication of PFO which can lead to ischemic stroke, especially in patient without or less CV risk factors, such as those without HTN, diabetic, smoker, and those in younger age.
Keywords: Cardioembolic stroke, patent foramen ovale

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Catheter Directed Thrombolysis For Acute Limb Ischemia Patient With Severe Mitral Stenosis And Atrial Fibrillation

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Background: Acute limb ischemia (ALI) is a potentially life-threatening clinical event. Catheter-directed thrombolysis (CDT) is the treatment of choice for patients with relatively mild acute limb ischemia (Rutherford class IIa) with no contraindication to thrombolytic therapy.
Case Ilustration: A female, 39 yo patient came to emergency with acute bilateral leg pain since 20 hours prior to admission. She denied any history of intermittent claudication before. She felt shortness of breath and palpitation 4 hours prior to leg pain. She has history of CHF, severe mitral stenosis due to RHD and atrial fibrillation since 2 years and planned for MVR. Physical examination and DUS concluded patient with ALI Rutherford class IIa of both leg, start heparin drip and continue with CDT procedure on the next morning. We found subtotal occlusion left aortoiliaca artery with high burden thrombus (slow flow) and subtotal stenosis at osteal of right aortoiliaca artery with thrombus. We gave alteplase 20mg bolus in 15 minute directly through catheter at aortoiliac junction, continued with heparin solution flush for 15 minutes. Angiographic evaluation showed technical successful with grade 2 thrombus lysis and clinical improvement. DUS examination 2 days post CDT showed triphasic flow of artery until distal on both leg. Patient continue with warfarin and heart failure standard therapy.
Conclusions: CDT is limb-saving treatment for marginal limb-threatening patients (ALI Rutherford class IIa). Graded infusion technique CDT showed good outcome in acute limb ischemic patient with severe mitral stenosis and atrial fibrillation. It is important for risk factor management of patient with high risk emboli to prevent recurrent ALI.
Keyword: *catheter-directed thrombolysis, acute limb ischemia, mitral stenosis*

Indonesian Journal of Cardiology
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pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Coronary Artery Ectasia: Does It Contribute To The Outcome Of Fibrinolysis In Stemi Patient?

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Background: Patients with acute myocardial infarction need an optimal reperfusion strategy. Several indicators of successful reperfusion strategy are improvement in chest pain, presence of reperfusion arrhythmias, resolution of the ST segment and improvement in hemodynamic conditions. Several aspects can affect the outcome of a fibrinolysis strategy including the area of the infarct, the duration of the ischemic, coronary anatomical profile, and the drug regimen used. The incidence of findings in patients with coronary artery ectasia (CAE) profiles varied in each coronary angiography, it is about 0.3% and 4.9%. In this case, an abnormal coronary anatomy profile was obtained on RCA from STEMI patient post failed fibrinolysis. CAE is defined as a form of coronary aneurysm characterized by localized or diffuse abnormal dilatation. This case report will discuss the effect of an ectatic coronary profile on the success rate of fibrinolysis. The achievement of clinical success indicators for fibrinolysis, cardiac records and results of the TIMI 3 Flow in coroangiography are targets to be achieved in the management of patients with acute myocardial infarction in order to bring a better prognosis for patients and reduce patient mortality.
Case illustrations: a 52 year old male patient presented with the main complaint of chest pain and was diagnosed as Posterior Inferior STEMI. Then, it was performed fibrinolysis but the result was unsuccessful (patient still complained about his pain and there were no resolution of ST segments). Treatment was followed by a Rescue PCI and CAD-1VD was obtained with significant right coronary artery stenosis (RCA) and an ectatic image in the distal segment with TIMI 2 Flow.
Conclusions: of the infarct, the duration of the ischemic, coronary anatomical profile, and the drug regimen used. In patients with an ectatic coronary profile, there is an abnormality of the coagulation system that affects the thrombus degradation process. This imbalance in the coagulation and fibrinolysis systems can also increase the risk of myocardial infarction and coronary artery thrombotic events.
Keywords: coronary artery ectasia, STEMI, fibrinolysis

Indonesian Journal of Cardiology
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pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Coronary Artery Fistula: to Close or Not to Close?

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Background: Coronary Artery Fistulas (CAF) are rare entities with incidence ranging from 0,1 to 0,8% in adult population. It is characterized by connection between coronary arteries and cardiac chamber or major blood vessel. Its clinical course is highly variable and rather unpredictable. The current guideline suggests that patients with small, asymptomatic CAF should not undergo closure. However, existing guidelines are based largely on expert opinion, hence the decision making for CAF closure need to be tailor-made. CAF can produce disturbances in coronary hemodynamics. Moreover, fistulas terminating in right-sided chambers or Pulmonary Arteries (PA) can lead to pulmonary hypertension, requiring closure of CAF. Ergo, proper evaluations are needed for the CAF closure decision-making. This report is aimed to emphasize the diagnostic approach used to determine the decision of CAF closure.
Case Illustration: A 65-year-old woman was referred to our center with chief complaint of palpitation, with history of ventricular tachycardia in the referring hospital. Upon prior coronary angiography, coronary fistulas from LAD and RCA was found terminating in PA. We decided to assess the disturbance in coronary hemodynamics or potential of pulmonary hypertension by instantaneous free wave ratio (iFR) measurement and right heart catheterization. Our findings showed that the fistulas were originating from LAD, LCx and RCA and terminated in PA. In addition to that, we suspected a 'double barrel' anatomy of the left system. The iFR measurements of distal LAD, LCx, and RCA were 0.95, 1.0, and 1.07 respectively with flow ratio of 1.12. Due to lack of signs of coronary hemodynamics disturbance and relatively normal flow ratio, it was then decided to treat the CAF conservatively.
Conclusions: CAF causing symptoms or coronary and hemodynamic disturbances require closure. Proper assessment of hemodynamic changes caused by CAF could help determine the treatment course.
Keywords: Coronary artery fistula, iFR, CAF closure

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Coronary Intervention in R-ACAOS

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Background: Anomalous origin of the coronary artery from the opposite sinus of Valsalva (ACAOS) is a rare inborn disease that is characterised by an anomalous course and/or termination of a native coronary vessel. Coronary arteries of anomalous origin are uncommon and encountered in 0.2–1.2% of patients undergoing percutaneous coronary intervention and represent a marked deviation of the normal anatomic pattern. The unusual location and course of this anomaly poses a considerable technical challenge to the cardiac interventionalist.
Case illustrations: Male patient age 61 years old with typical angina symptom 26 hours before admission. Patient was a smoker. The ECG showed junctional rhythm with ST elevation on inferior lead. Male patient age 47 years-old with symptom of angina on daily activity since 2 months ago. Patient had history of MI 2 months ago in another hospital. Patient was active smoker. The ECG shows Inferior Q waves with inverted T in inferior and anterolateral lead. Both patients went through PCI. The interventionist faced problem with the unusual location and course of this anomaly poses a considerable technical challenge. It requires a systemic approach to the evaluation of coronary anatomy and distribution in order to avoid complications. In particular, the selection of an appropriate guiding catheter is critical to ensure selective angiography, proper assessment of lesion characteristics and facilitate successful delivery of appropriate devices.
Conclusions: R- ACAOS is a rare anatomic condition that can be found accidentally during CAG or PCI in patient with chest pain. The difficulty that an intervensionist faced not just to the complexity of the lesion but also the technique to achieve excellent support on PCI and achieve excellent result. Recognition of the R-ACAOS and selection of the right equipment will provide a better result with minimum dose of radiation and contrast.
Keywords: R- ACAOS, PCI, coronary intervention

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Critical Aortic Coarctation with No Stent Landing Zone: Outcome of Balloon Angioplasty in 6 months Follow Up

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Background : Aortic coarctation can lead to early death predominantly because of hypertension and its cardiovascular complications. Surgical approach for aortic coarctation has been available for more 50 years and has improved hypertension and survival. Recently, endovascular techniques have offered a minimally invasive alternative to traditional open repair. So far there is no guidelines recommendation stated which technique is better in aortic coarctation.
Case Illustration : A 27-year-old male with history of severe or resistant hypertension at the age of fifth teen presented to our adult outpatient clinic for routine follow-up. He stated that he had mild headaches and had normal functional capacity. Physical examination findings were within normal limits. Chest X-ray showed normal heart size. Patient was performed renal ultrasound and computed tomography angiography to excluding the renovascular hypertension. Cardiac magnetic resonance (CMR) imaging was performed for surveillance of the aortic coarctation and revealed critical narrowing in distal part of the aortic arch and proximal part of descending thoracic aorta measuring an anteroposterior diameter of 5-10 mm that slightly after the origin of the left subclavian artery. We decided to do balloon angioplasty in this young patient. After the intervention the blood pressure was normal and in the 6 months follow up there were no restenosis and hypertension.
Conclusion : Balloon angioplasty in aortic coarctation which is not suitable by Thoracic endovascular aortic repair (TEVAR) could be considered with good six months follow up. Longer follow up is needed to confirm this result.
Keywords: Aortic coarctation, Severe or Resistant hypertension, Balloon Angioplasty

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Dealing with Annoying Supraventricular Tachycardia during Percutaneous Atrial Septal Defect Closure

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Background: Atrial septal defect (ASD) are the most common form of congenital heart defect. Risk of arrhytmia in increased wit late age of ASD closure, which may happen due to electrical remodelling that may predispose supraventricular tachycardia (SVT)
Case illustrations: An 18-year-old male patient previously diagnosed and treated at the paediatric department with an ASD, experienced an SVT during the first attempt to close the ASD percutaneously. The SVT was induced every time the catheter entered the left atrium (LA), so the procedure was aborted and the patient was referred to the cardiology department after the patient was 18-year-old. We proceeded the patient for another attempt to close the ASD percutaneously. The SVT was induced again every time the catheter entered the LA, but it was successfully terminated when the catheter induced a ventricular premature complex (PVC) from right ventricle outflow tract (RVOT). The SVT was recurrent and always happened when the catheter or device entered the LA, so we decided to place the catheter at the RVOT to induce the VPC and overdrive the SVT during the whole procedure until the atrial septal occlusion device was in place.
Conclusions: SVT often happens during percutaneous ASD closure and may be dealt by inducing a VPC from the RVOT
Keywords: Supraventricular tachycardia, Percutaneous, Atrial Septal Defect

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Device Occlusion Test for Patent Ductus Arteriosus with Severe Pulmonary Arterial Hypertension

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Background: Patent ductus arteriosus (PDA) accounts for 5-10% of all congenital heart disease. Persistent left to right shunting is associated with pulmonary arterial hypertension (PAH) and Eisenmenger physiology. Treatment of patient with PDA and PAH is challenging because the outcome of defect closure depends on the reversibility of pulmonary vascular changes. This indicate the importance of accurate decision making. Transcatheter closure of PDA with various devices is a well-established and less invasive technique alternative to surgical closure. At present, no specific method is available for determining who will respond favourably to defect closure.
Case illustrations: there were three cases with PDA and went to PDA closure with device. It has recently been shown that device occlusion test can be used cautiously in PDA with severe PH to evaluate the pulmonary vascular response in order to determine whether to proceed to permanent closure.
Conclusions: Device occlusion test helps to determine anticipated hemodynamic after closure of PDA, it is conducive to indicating permanent closure in reversible and severe PH. Satisfactory immediate and short-term outcomes have been shown this method to be visible and can be used to consider the indication of closure of PDA.
Keywords: Device occlusion test, patent ductus arteriosus, pulmonary arterial hypertension

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Ductus Arteriosus Stenting In Pulmonary Atresia Intact Ventricular Septum : As It Happens, We Have To Use Whatever Is Available

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Background: To learn Patent Ductus Arteriosus (PDA) Stenting as an alternative procedure to improve shunting in duct dependent congenital heart disease.
Case Illustrations: We reported a 13-day-old newborn diagnosed with Pulmonary Atresia Intact Ventricular Septum (PAIVS). During hospitalization in Neonatal Intensive Care Unit (NICU) the newborn developed hypoxia spells with a peripheral oxygen saturation 40%. Cardiac catheterization showed PDA morphology suitable for stent implantation. It was decided to implant a coronary stent cre8 3.5 x 12 mm. PDA graphy results after procedure showed inflated stent in PDA, No Hazy stent appearance. The peripheral oxygen saturation improved from 40% to 93% until the patient is discharged. Routine monitoring should be done until definitive surgery is performed.
Conclusions: We decided to do PDA stenting in this patient due to the limitations of performing emergency surgery at our center. As it happens, one often has to use whatever is available. This procedure can be used as a life-saving procedure when performed by skilled and experienced operators in pediatric cardiac catheterization and intervention. Various literature have shown the feasibility, safety, effectiveness and satisfaction results in certain cases that meet the criteria. The principle of selecting the type of stent in this procedure depends on the type of stent which are available in given emergency condition.
Keywords: Ductus arteriosus, pulmonary atresia, ventricular septum

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Experience Of Zero Fluoroscopy Asd Closure In Haji Adam Malik Hospital Medan Before And During Pandemic: A Case Series

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Background: Transcatheter closure of Atrial Septal Defect (ASD) has become the first choice for most cases of secundum ASD with good efficacy, low complication rate, and earlier hospital discharge. Since the risk of radiation exposure to both patient and operator has gain increasing awareness, transcatheter closure under guidance of echocardiography alone was became alternative. Haji Adam Malik Hospital was the second center who done zero fluoroscopy ASD Closure in Indonesia independently. To briefly explore the experience of zero fluoroscopy ASD closure in Haji Adam Malik Hospital Medan, focused on how to prepare and perform the procedure before and during the Covid-19 pandemic.
Case illustrations: There were 5 cases of secundum ASD performed zero fluoroscopy atrial septal closure in Haji Adam Malik Hospital Medan during January till July 2020; 3 patients were performed before Covid-19 pandemic, 2 patients during the pandemic. Transoesophageal echocardiography was performed to measure rim; 3 was scheduled on outpatient clinic, 2 was done right before the ASD Closure procedure during the pandemic. Swab test for RT-PCR SARS-CoV-19 was done for 2 patients before sent to the catheterization lab. 1 patient suspected had coexisting pulmonary hypertension, right heart catheterization and vasoreactivity test was done resulted reactive oxygen test. The delivery sheath was guided by TEE into left upper pulmonary vein, right upper pulmonary vein, or in left atrium for deployment. During the procedure, 1 patient developed transient supraventricular tachycardia, others had no complication. Residual shunt, occlusion device shedding or displacement, and pericardial effusion were not observed during or after the procedure. One-to-six months follow up showed improvement of symptoms and TTE.
Conclusions: Zero fluoroscopy ASD Closure was safe, effective procedure, and feasible during Covid-19 pandemics era
Keywords: ASD, closure, zero fluoroscopy, guiding TEE

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

False Successful Fibrinolytics

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Background: Fibrinolytic therapy is an important reperfusion strategy in settings where primary PCI cannot be offered in a timely manner. Fibrinolytic will be considered successful if ST-T segment resolution >50% at 60–90 min; typical reperfusion arrhythmia; and disappearance of chest pain. Furthermore, according to Appropriate Use Ratings for Revascularization in ACS in SCAI Guideline 2012, for patients who have been treated with fibrinolytic, subsequent PCI may be needed for the following indications: the patient has evidence of heart failure, recurrent ischemia, or unstable ventricular arrhythmias.
Case illustrations: We report a case of a 62-year-old man with history of hypertension and ex-smoker. He presented with 3 hours of symptom onset of inferior and posterior STEMI. Due to financial issue, the choice of therapy was only by fibrinolytic with streptokinase 1,5 million units. After fibrinolytic, the chest pain disappear, ST-T segment resolution > 50% and reperfusion arrhythmia. Then we performed echocardiography and the conclusion was LVH concentric, EF 41%, and hypokinetic of inferior, posterior, anteroseptal wall. Therefore, patient had PCI subsequently. The patient suffered total AV block during coroangiography, hence he had a temporary pacemaker. The angiography revealed total occlusion of mid RCA, ostium stenosis 80% of LAD and ostium stenosis 70% of LCx, stent patent in situ. We decided to perform an interventional procedure on the RCA. Stent implantation was performed with 2 DES at mid RCA using 2,75/18 and 2,5/33 overlapped with the first stent. Final angiography revealed no residual stenosis, coronary dissection or thrombus found. TIMI flow grade 3. Temporary pace maker was removed after PCI.
Conclusion: We reported a case of a 62-year-old man who underwent early PCI after fibrinolytic which seemed to be successful, but the echocardiography findings shown contrary result. Criteria for successful fibrinolytic therapy are still debatable and need to be reviewed carefully.

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Finding Yourself At The Crossroads: Emergency PDA stenting or BT-Shunt For Hypercyanotic Spell of Late Presenter Pulmonary Atresia Ventricular Septal Defect?

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Background: Patient with Pulmonary Atresia Ventricular Septal Defect was indicated for first stage BT shunt palliative surgery when the pulmonary artery size was inadequate. However, when faced with intractable hypercyanotic spells, emergency PDA stenting is the preferred method due to lesser preparation of transcatheter strategy than the surgical procedure.
Case illustration: A 1.5-year-old male baby with pulmonary atresia ventricular septal defect and secundum atrial septal defect was sent to the national cardiovascular center to undergo a Blalock-Taussig shunt procedure. The patient was severely debilitated (unable to sit or walk) due to the daily hypercyanotic spell. When admitted for a diagnostic catheterization procedure, the patient went into an intractable hypercyanotic spell, which ended up with intubation. While the original plan was to do a BT shunt palliative surgery, PDA stenting was chosen due to the persistent maximal saturation of 60% despite the intubation. The patient was then sent to the cath lab for PDA stenting using the retrograde approach. Wire crossing was done using Versatum wire, and balloon pre-dilatation was done using Ryujin 3.0x15 mm. PDA stenting was done using DES Xience Prime 4.0x33 mm. However, since there was a curved part of the PDA due to the aborted aortic arch development during the embryonic stage, we need two stents to cover the all of the PDA. Therefore, DES Xience Prime 4.0x23 mm was used to cover up the rest of the PDA using the overlapping technique. Saturation after the procedure was 83% and was well during the hospital stay. No cyanotic spell happened after the procedure.
Conclusions: Emgergency PDA stenting as an alternative approach can be safe alternative, less invasive, practical, less preparation procedure
Keywords: Emergency PDA stenting, Hypercyanotic spell, PA-VSD, Crossroads

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Fusion Imaging for Structural Heart Disease Intervention

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Background: Percutaneous transcatheter procedure for structural heart disease is growing in interventional cardiology. Echocardiography and fluoroscopy are the cornerstone in for structural heart disease intervention, but they appear in different screen. Fusion imaging is multimodality imaging, synchronized echocardiography and fluoroscopy in real time. Simultaneous visualization of x-ray image and echocardiographic view shows increase in safety, accuracy, and effectiveness of intervention
Case illustrations: there are 3 cases. The cases are including VSD, ASD sekundum and severe mitral stenosis. All patients was examined using real time fusion imaging with echocardiography and fluoroscopy.
Conclusions: Real time fusion imaging using echocardiography and fluoroscopy can give the accurate position for device placement in congenital heart disease and pinpoint precise location of transeptal puncture and balloon valvulotomy in MS and also reducing complication such as device emboly, false route during transeptal puncture and Mitral regurgitation.

Keywords: Fusion imaging, structural heart disease, interventions

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

How to Deal with Unprotected Left Main Trifurcation ?

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Background: Percutaneous coronary intervention (PCI) for left main (LM) stenosis is remain challenges. Furthermore, significant lesions involving the bifurcation or even trifurcation of the left main represent extreme challenges. Several strategies have been described for the treatment of coronary trifurcation lesions. None is universally successful and, despite advances in equipment and technique including the use of drug-eluting stents, procedures involving major-branch vessels remain challenging. Previous studies demonstrated the importance of kissing balloon inflation to restore optimal stent apposition. Especially in these extreme interventional procedures modern imaging tools, such as intravascular ultrasound (IVUS), should be used to guide the procedure and, especially, control the achievement of the desired results. We therefore describe a case of IVUS-guided PCI treatment of an unprotected left main trifurcation.
Case Illustrations: A 55 year-old man with chronic coronary syndrome was referred to our hospital for coronary angiography. A trifurcation stenosis was found at LM. Stenosis appeared to be 30% in LM. His proximal left anterior descending (LAD) was 70% stenosis, proximal left circumflex (LCx) was 90% stenosis, and intermediate branch was 30% stenosis. Preparation lesion with rotational atherectomy (RA) was done in LM, LAD and LCx before dilation with cutting balloon 3.5 mm x 10 mm, and non-compliance balloon 3.5 mm x 12 mm. A drug eluting stent (DES) 3.5 x 28 mm was deployed in proximal-mid LCx. Kissing balloon was performed in LAD and LCx. A second DES 3.5 x 23 mm then deployed in LM-LAD followed second kissing balloon in LAD and LCs. Trifurcation lesions are technically challenging for percutaneous intervention with the potential for both early procedural complications (stent distortion, plaque shift, dissection, side-branch trapping) and late in-stent restenosis. Whenever possible, a simple strategy of only stenting the main vessel appears to give the best results, regardless of whether bare metal or drug eluting stents are used. When both branches need stenting to obtain an adequate initial result, various strategies have been described, including T-stenting, V-stenting, the culotte technique, and, more recently, the crush technique. Although drug-eluting stent deployment for trifurcation lesions is associated with a lower restenosis rate than with bare metal stents, restenosis often occurs at the branch vessel ostium and may be due to inadequate vessel coverage and scaffolding, inadequate drug delivery, or stent underexpansion or distortion. Better stent apposition and ostial coverage should give better drug delivery and remove a potential nidus for thrombus formation and smooth muscle proliferation. Kissing balloon post dilation is key to achieving side-branch ostial scaffolding and stent apposition
Conclusions: left main trifurcation stenting remain challenging in nowadays. Regardless strategy, kissing balloon appears important to achieve an optimal angiographic and clinical outcomes.
Keywords: left main, trifurcation, bifurcation, percutaneous coronary intervention

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Hypoplastic Left Heart Syndrome: Palliative Hybrid Management and Its Pitfalls

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Background: Survival of infant with Hypoplastic left heart syndrome (HLHS) depends on the ability to maintain unobstructed systemic blood flow, controlled pulmonary blood flow and unrestrictive interatrial shunt (IAS). Infants with HLHS classically undergo Norwood Stage I procedure early in neonate period, however, this procedure has high mortality rate and requires cardiopulmonary bypass (CPB) time. Alternative "hybrid approach" has been proposed which does not requires CPB, consists of combination of bilateral pulmonary artery banding (BPAB) surgery and patent ductus arteriosus (PDA) stenting, with balloon atrial septostomy (BAS) or IAS stenting if atrial septal defect (ASD) is restrictive. The goal of this presentation is to present the first case of HLHS in National Cardiovascular Center Harapan Kita (NCCHK) managed with hybrid approach and its outcome.
Case illustrations: A-10- days old male baby referred to NCCHK with HLHS diagnosed prenatally and was already on prostaglandin analogue infusion since birth. Echocardiography showed restrictive IAS as patient later develop desaturation and acidosis. Patient was considered as high risk for Norwood stage I palliation, thus "hybrid" procedure was decided. First, IAS stenting was performed following a failed BAS. Then, BPAB surgery continued with stenting of the PDA was performed.
Conclusions: In HLHS infants considered as high risk for Norwood Stage I palliation, hybrid approach can be considered as an alternative. However, despite advances in surgical management, mortality rate of infant with HLHS remains high.
Keywords: Hypoplastic left heart syndrome, palliative hybrid

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Iatrogenic Right Coronary Artery Dissection With Cardiac Tamponade Complication: A Dilemmatic Decision Among The Limitations

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Background: Iatrogenic coronary artery dissection (ICAD) during diagnostic coronary catheterization is a rare but life-threatening event with a reported incidence of less than 0.03-0.3 %. A tear (dissection) sometimes could lead into perforation of coronary vessel. The incidence of coronary perforation is 0.84% of PCI cases. The exact mechanism of dissection or coronary perforation is not clear. Right coronary artery (RCA) dissection is more common than left main dissection because of relative size differences in the ostia, position and also the histology. The ideal management of acute coronary dissection or perforation, whatever the cause, is prompt restoration of vessel patency to limit the duration, extent of ischemia and to prevent further complication of coronary perforation, such as cardiac tamponade.
Case Illustrations: A-49 years old man with acute inferoposterior STEMI late onset (1 days) TIMI 2/14 Killip I was performed cath standby PTCA. RCA was cannulated by JR 6F Catheter, there was total occlusion at mid RCA, thrombus burden grade V. The patient was implanted 1 stent DES at mid-distal RCA. Only 10 minutes after catheterization at the ward, the patient suddenly complained of severe chest pain. From the electrocardiogram showed ST-segment elevation and Q pathologist in II,III,aVF, ST-segment elevation in V3-V5, ST-segment depresion in I,aVL and 1st degree AV block. We assess the patient with suspect stent thrombosis and transfered him back to the cath lab. Because the patient got increased shortness of breath, we took the echocardiography to make sure about the symptom and found pericardial effusion with the sign of tamponade. From the pericardiosintesis, it took 450 cc of haemorrhagic pericardial fluid. From the second angiography, the RCA was found to be dissected at the distal of the previous stent. We tought that it must be more than just a coronary dissection, but it already lead to perforation. The damaged vessel ideally must be repaired with covered stent, but doe to the limitations of tools and from the angiography we could see that there was no direct perforation, so we decided to implant one drug-eluting stents into the distal RCA. The final result was satisfactory with nicely restoration of TIMI III flow and myocardial blush grade III. The patient transfered to CVCU and stabilized for several days.
Conclusions: Iatrogenic coronary artery dissection or perforation during diagnostic coronary catheterization is a rare but life-threatening event. Early diagnose and urgent treatment are very important to make a better outcome.
Keywords: iatrogenic coronary artery dissection, coronary perforation, coronary angiography, RCA

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Instent Thrombosis, Deferred stent or Not ?

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Background: Insidence of sub-acute instent thrombosis 1.4% of acute coronary syndrome. Procedure-related instent thrombosis are stent edge dissection and high thrombus burden lesion. Percutaneous coronary intervention often results in low TIMI flow or even No flow in instent thrombosis cases, this is due to high thrombus burden and microvascular obstruction. The intervensionist needs to decide whether to deferred stent or not in this case?
Case illustrations: we reported Male, 41 years old, with a diagnosis reinfarction ec instent thrombosis. History of STEMI inferior post PCI with DES in RCA 11 days ago. The patient had Diabetes mellitus and was smoker. Patient's fasting glucose : 173 mg/dl, Troponin 0.34, other results within normal limits. The echocardiography : Normal LVEF 56% with hypokinetic inferoseptal and inferolateral.
Conclusions: Risk factors for instent thrombosis in this patient are diabetes mellitus, the possibility of stent edge dissection and high thrombus burden lesion. Stent edge dissection can precipitate thrombosis and high thrombus burden lesion dan precipitate distal embolization. Deferred stent aim to give time for reduction of coronary thrombus burden and recovery of microvascular function. Deferred stent in instent thrombosis cases result in higher TIMI flow and MBG, a lower incidence of intra procedure thrombosis and distal embolization.
Keywords: instent thrombosis

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Jailed Balloon Protection In Provisional Stenting Strategy

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Background: Provisional stenting strategy is preferable over 2 stent strategy in terms of treating most of bifurcation lesion. However, there is a risk of side branch (SB) compromise once the stent placed at the main vessel. Jailed balloon protection (JBP) has been in order to prevent the risk of SB occlusion.
Case Illustration: A 65 year-old male with symptom of dyspnea on exertion. LVEF was 25% and viability study revealed 15% ischemic burden. Coronary angiography shown Medina 1-1-1 lesion at the proximal LAD to the D2 branch. The D2 had a large myocardial territory. Provisional stenting strategy with JBP was performed to avoid SB compromise. Two floppy wire advanced to distal LAD and D2. Small SC balloon with 1.5 x 15 mm size inflated at the LAD and D2 bifurcation and at ostial D2. The balloon still remained at the D2 branch. Another 2.5 x 15 mm SC balloon inflated at the proximal LAD and just after the D2 bifurcation. A 3.5 x 20 mm size DES deployed at the bifurcation site simultaneously with side branch balloon inflation. The jailed SB balloon was removed. Lastly, proximal optimization technique (POT) was done by inflating a 3.5 x 12 mm NC balloon at the proximal part of the DES. Final angiography shown no SB occlusion. In provisional stenting strategy, the most common mechanisms of SB occlusion after MV stenting are carina and plaque shift. Previously, jailed guidewire technique has been widely used to prevent SB impairment. Nevertheless, it is also associated with the risk of jailed wire entrapment after MV stenting. JBP accomplished by inflating a balloon in the SB. This technique has recognized as a simple and quick way to avoid SB occlusion. The current trial showed that JBP comprises enlargement of a tube close to the bifurcation of the MB into the SB and stent deployment. Therefore, SB will be protected after MV stenting by simultaneously keeping SB against plaque shift and carina shift.
Conclusions: JBP is safe and beneficial in provisional stenting strategy to avoid the SB impairment after MV stenting.
Keywords: jailed balloon protection, stenting

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Limb Preservation in Critical Limb Ischemia with Distal Superficial Femoral-Tibial Artery Occlusive Disease - Endovascular Intervention : A Case Report

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Background: Chronic limb-threatening ischemia (CLTI) is a clinical syndrome defined by the presence of peripheral artery disease (PAD) in combination with rest pain, gangrene, or a lower limb ulceration >2 weeks duration. The initial treatment approach for CLI may significantly impact the subsequent risk of major amputation or death. The purpose of this presentation is to discuss how to manage CLTI patient with endovascular first strategy to salvage the limb.
Case illustrations: A 72-yo female with resting pain in her right leg since 4 months ago. She had necrotic wound since 4 moths ago in her right toes. The wound getting wider and the toes was amputated a month ago. The wound persisted and the bone was exposed but she felt numbness. Uncontrolled hypertension since 10 years ago
Conclusions: Revascularization is a fundamental strategy to limb preservation. CLI is often associated with multilevel disease and establishing direct in-line flow to the foot is the primary technical goal. Endovascular revascularization has lower morbidity and mortality. Holistic CLI management was needed including intensive medical therapy, pain management, and control of infection.
Keywords: Limb preservation, critical limb ischemia, endovascular intervention

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Neonatal Critical Aortic Stenosis : Is it Ballon Atrial Valvuloplasty Still Remains First Line Therapy?

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Background: Aortic Stenosis is the most frequently LVOT Obstruction in newborn with incidence 3.8 in 10,000 live births. Most children are relatively asymptomatic but the most severe form represent signs of hypoperfusion or respiratory distress within days to weeks after birth with high of mortality rate and represent challenging in treatment approachment.
Case illustrations: Ten Days Old baby girl was reffered to Sardjito General Hospital with complaint of symptom of heart failure, cyanosis especially when breastfeeding and jaundice. She was born from P_2A_0 mother with normal gestational ages and low birth weight. From physical examination found hemodynamic was stable with systolic thrill palpable at Upper Right Sternal border over carotid arteries, systolic ejection click over aortic area, weak peripheral pulse and jaundice. From TTE examination found severe Aortic stenosis with gradient of 68 mmHg. From catheterization found LV pressure was 125/17 with aortic 60/50. Aortic annulus width was 6 mm. Patient was procced to ballon aortic valvuloplasty. This process went well with last pressure LV was 62/26 and Aortic was 47/35. From TTE evaluation found mild residual Aortic Stenosis with gradient of 28 mmHg and mild Aortic Regurgitation. Patient was stable and moved to NICU for further treatment. Treatment of critical aortic stenosis (AS) represent a challenging. The two main treatment modalities currently available are balloon aortic valvuloplasty (BAV) and surgical aortic valvuloplasty. For decades, (BAV) has been firmly established as the most effective intial treatment but high risk of aortic regurgitation and reintervention rate still become debatable during last decades.
Conlusion: Multidisciplinary approchment should consider based on left ventricle function, morphology of the aortic valve, and underlining clinical condition should be consider to choose the most of appropriate treatment modality.
Keywords: Neonatal, aortic stenosis, ballon atrial valvuloplasty

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Occluded PDA In Mixing Duct Dependent Congenital Heart Disease: Is There Any Hope For A Dead End?

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Background: Occlution of the Ductus Arteriosus in mixing duct-dependent congenital heart disease is a precarious condition that required an early intervention. PDA Stenting as an alternative method to provide an adequate mixing and stable source of pulmonary blood flow until the suitable time when a more definitive reparative or palliative surgical procedure can be performed.
Case illustration. Cyanotic infants aged 21 days with a diagnosis of Transposition of Great Arteries with Intact Venctricular Septum Post Ballon Atrial Septectomy at 4 days of age were referred to NCCHK. Patients still on prostin at 10 nano/kg, but the saturation was around 50-55%. Blood gas analysis showed acidosis with increased of lactate. We decided to send the patient to the cath lab for PDA Stenting immediately. The angiography results showed that there was a small PDA that comes from the LPA. Using trans-arterial approach, we tried to cross the PDA by Fielder XT wire with back up JR guiding catheter, but with no success. Finally, using the Runthrough Floppy wire with LIMA 5F catheter wire crossing can be done. Balloon predilatation was done using Ryujin 3.0 x 15 mm, and 2 DES Xience Prime 4.0 x 15 mm was implanted with overlapping technique to cover the all PDA completely. The saturation after the procedure increased to 93% and the clinical condition has improved.
Conclusions: Occluded PDA in mixing duct-dependent congenital heart disease is complicated case that required early intervention. PDA stenting could be the best alternative.

Keyword: PDA stenting, mixing duct dependent pulmonary blood flow, wire crossing of occluded PDA.

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Percutaneous Pharmacomechanical Thrombectomy For Management Septic Emboli Manifest As Acute Limb Ischemia Due To Infective Endocarditis

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Background: septic emboli due to infective endocarditis is rare on lower limb and contributes of 3%-6% cases. Surgical embolectomy was the only reported treatment for acute limb ischemia (ALI) due to infective endocarditis. The effectivity of percutaneous mechanical thrombectomy was unknown.
Case illustrations: a 24 year old female diagnosed as infective endocarditis with streptococcus sanguinis infection suffers from acute left leg pain and numbness. The patient was diagnosed as ALI Rutherford IIa. Thrombus in left femoral artery was found by doppler ultrasound. The echocardiography showed the large mobile vegetation which decrease in size compared to the previous echocardiogram. Urgent angiogram was performed and showed total occlusion in left superficial femoral artery. After re-occlusion by balloon angioplasty then we performed percutaneous mechanical thrombectomy with angiojet and litic bolus with alteplase. The angiography evaluation showed that the flow was going through distal artery and no thrombus was found. Hemoglobin after the procedure dropped 3 gr/dl possibly due to hemolysis effect and resolved after transfusion. Anticoagulant and antibiotic were given. Treadmill performance in the next 3 days was 2.83 METs, and the patient was discharged. The patient can do daily activity without complains.
Conclusions: percutaneous pharmacomechanical thrombectomy with angiojet is effective for management of septic emboli manifest as ALI. Further studied are needed to confirm the result.
Keywords: Acute limb ischemia, septic emboli, infective endocarditis, pharmacomechanical thrombectomy, angiojet

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Percutaneous Transcatheter Closure of a Residual Patent Ductus Arteriosus After Surgical Ligation in Adult – a case report

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Background: Percutaneous transcatheter closure has gained acceptance for Patent ductus Arteriosus (PDA) management ever since its introduction, including management for the small residual left to right shunt PDA following surgical ligation. It is preferred than the more invasive surgical closure. While large PDA is closed to prevent heart failure, small PDA is closed to prevent Infective Endocarditis (IE), especially for patients who have a previous history. However, the decision to close a small hemodynamically insignificant PDA is still a debatable issue. We present a case of percutaneous transcatheter closure of small residual left to right shunt PDA using HeartR^{TM} lifetech PDA occluder with instantaneous closure ability on an asymptomatic adult patient with past history of IE.
Case illustrations: A 28-year-old male patient was presented to us with no symptom, there is no atypical chest pain and no shortness of breath. He had undergone PDA ligation and endarteritis surgical repair 1.5 years ago at 26 years old. He was born prematurely. He had a medical examination one year after the operation. His vital sign was normal, while two-dimensional echocardiography revealed residual PDA with a left to right shunt
Conclusions: Closure of small residual hemodynamically insignificant PDA is still a debatable issue. The closure of such PDA is often recommended to prevent IE. Considering that IE is a fatal complication should it occur and the patient's previous history of IE, we decided to close the PDA.
Keywords: Percutaneous transcatheter closure, residual patent ductus arteriosus, surgical ligation

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Percutaneous Transcatheter Closure of Pulmonary Arteriovenous Fistula

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Background: Pulmonary arteriovenous fistula (PAVF) are rare, abnormal low resistance vascular structures that connect a pulmonary artery to pulmonary vein, thereby bypassing the normal pulmonary capillary bed and resulting in an intrapulmonary right to left shunt. PAVFs are clinically and radiologically divided simple dan complex type. The preferred screaning test for PAVF is transthoracic contrast echocardiography. CT has become the gold standar imaging test to establish the presence of PAVF.
Case illustration: This case is a 2- year old boy with cyanosis. The only finding on physical examination were cyanosis. Ct scan without contras showed cardiomegaly and aneurisma Right Pulmonary Artery. PAVF that were later confirmed on cardiac catheterization. The fistulous trajectories were then embolized with PDA device HearT 6/8 (lifetech), which resulted in an immediated increase in the arterial saturation of blood oxygen. PAVF is not easily diagnosed routinely, due to its rarity and its unspecipic findings on routine examinations. However, this diagnostic hypothesis should always be considered when examining children with cyanosis, in whom the initial test do not detect cardiac abnormality. Contras echocardiography is one of the alternative diagnostic investigation was not used in the present case. The calculation of the shunt through the saturations measured with catheterization in the different cardiac chambers. In the case we report, diagnosis was established by CT scan and catheterization. Interferon has been suggested as a less invasive therapeutical approach, but until the present time, its efficacy has not been scientifically confirmed. Another alternative would be occlusion of each pulmonary lobe with a ballon, therefore checking whether selective embolization with detachable balllon cuould replace pneumectomy. Embolization with coils has also been successfully used, even in the patiens with telangiectasia. In our case, we chose the interventional approach, with embolization with PDA occlude, because of the great number of fistulous trajectories, and the result was considered satisfactory.
Conclusions: We reporting Patient with PAVF with cyanosis, then embolized with PDA device HearT 6/8 (lifetech), which resulted in an immediated increase in the arterial saturation of blood oxygen.
Keywords: Pulmonary arteriovenous fistula (PAVF), Transcatheterization with PDA ocluder

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Performing Minimal Invasive Interventional Treatment In A Hemodialysis Patient With Symptomatic Central Venous Stenosis: A Case Report

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Background: Central vein stenosis (CVS) is common in hemodialysis patients because of the placement of cardiac intravascular devices, venous access and compromises vascular access. The effect may appear until an arteriovenous fistula (AVF) or graft is created in the ipsilateral arm or forearm for hemodialysis. The presence of an ipsilateral arteriovenous fistula or graft often leads to arm edema, severe venous dilatation, and recurrent infections.
Case illustrations: We report the case of a patient 50-year-old female with routine hemodialysis who developed symptomatic CVS. A Catheter-based venography showed a severe stenosis of her subclavian vein. This patient developed severe swelling of her left arms after performed ipsilateral arteriovenous graft due to central venous stenosis. The symptoms were recurrent to multiple endovascular interventions. We discuss the incidence and risk of central vein stenosis in hemodialysis patient and reported a successful minimally invasive interventional treatment. Percutaneous balloon angioplasty should be the first treatment of choice. Unfortunately, the primary patency after angioplasty or stenting is low. It can be repeated if there is recurrent stenosis.
Conclusions: Recent studies have shown that vascular access flow reduction by banding of the access inflow reduced the rate of re-stenosis and was able to resolve symptoms associated with non-correctable central venous lesions in patients who had previously undergone angioplasty and stent placement. The possibility of vascular access flow reduction was discussed with our patient and vascular surgeons, but because of the primary success of the interventional treatment, we decided to keep this alternative in case of a recurrence of central vein stenosis.

Keyword: central vein stenosis, percutaneous transluminal venoplasty, arm swelling, arterio-venous fistula, graft

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Polycythemia Vera presented with Atrial Flutter and ST segment Elevation with non-obstructive coronary arteries: A Case Report

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Background: Polycythemia vera is a rare disease characterized by elevated hemoglobin and hematocrit. It is often present with leukocytosis or thrombocytosis. This condition is related to hyperviscosity and thrombosis. Some articles reported polycythemia vera with myocardial infarction; however, there is a limited number of cases reported concurrently with atrial flutter. The elevation of ST-segment often indicates the presence of coronary occlusion and myocardial infarction. We report a case of polycythemia vera with atrial flutter and ST elevation without coronary occlusion.
Case Illustrations: A 49th years old man with a prior history of polycythemia vera admitted to the Hospital with palpitation and typical chest pain for 18 hours. The ECG revealed atrial flutter 202 bpm, Left Ventricular Hypertrophy, with ST-segment elevation on II, III, aVF, V1, V2, V3, and ST-segment depression on I, AVL, V4 and V5. The complete blood count showed markedly high leucocyte count (39.15x103/mL), hemoglobin (19.1 g/dL), hematocrit (64%), thrombocyte (669x103/mL) and Hs-Troponin (54.9). He was treated with amiodarone, antiplatelet, clopidogrel, statin, heparin, ACE-inhibitor, and beta-blocker during admission. Coronary CT Angiography showed normal coroner. Several pathophysiological mechanisms of ST-segment elevation without coronary occlusion are found in Myocardial infarction with non-obstructive coronary arteries (MINOCA)[1]. Hypercoagulable states including thrombophilia disorder is predisposition of MINOCA[1]. Polycythemia vera is a chronic myeloproliferative neoplasm of the blood that was characterized by a high number of hemoglobin, hematocrit, cell mass, sometimes followed by thrombocytosis or leukocytosis and chronic inflammatory state[2]. This condition is associated with hyperviscosity and reduced O2 saturation lead to tissue ischaemia[3]. Furthermore it can lead to abnormal re-polarization and increased work load causes left ventricle hypertrophy[3]. Polycythemia vera is a predictive factor of atrial arrhythmia in patients with myeloproliferative neoplasm, especially in the elderly population[3]. To detect the etiology of MINOCA is essential in order to choose further therapy[1].
Conclusions: This report presents a case of polycythemia vera patient with atrial flutter and ST elevation mimicking myocardial infarction without coronary occlusion detected by MSCT.
Keywords: Polycythemia vera, Atrial flutter, MINOCA

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Radial Arteriovenous Fistula After Percutaneous Coronary Intervention

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Background: The incidence of radial arteriovenous fistula is very rare, around 0.3%. If not treated immediately it can cause serious complications such as high output heart failure. The risk factors for fistula formation after Percutaneous Coronary Intervention (PCI) were female gender, hypertension, use of anticoagulants or fibrinolytics, multiple punctures, large catheter size, high Body Mass Index and old age.
Case Ilustrations: A 50-year-old male presented with a chief complaint of bruit on the right wrist. Patient felt the bruit 2 weeks earlier while sleeping with hand position on the head. Patient has had elective PCI using DES at LAD two months earlier. Patient has risk factors diabetes mellitus and is a former smoker. On inspection there was a lump in right wrist with size 1 x 1 cm2. Murmur was heard in the systolic phase accompanied with thrill. Echocardiography revealed regional wall motion abnormality with good right ventricular contractility, normal systolic and diastolic left ventricle function. Doppler ultrasound at right wrist revealed turbulent flow with mosaic colour, in low resistance pattern depicting a fistula with size 3.38 mm. Fistula repair surgery was performed without complications. Doppler ultrasound evaluation showed no visible fistula with a high resistance pattern.
Conclusions: Radial arteriovenous fistula reference is very limited because of its rare cases. From several previous case reports of arteriovenous radial fistulas with onset of more than 2 months, conservative treatment with mechanical compression has often failed so the options are surgical repair or percutaneous stenting. The use of a smaller sheath than the radial artery and avoiding multiple punctures can minimize fistula complications. Evaluation of radial artery access after coronary angiography is important. Radial artery fistula complications that are diagnosed earlier can prevent invasive treatment in patients even though the complications of fistula repair are low.
Keyword: radial arteriovenous fistula, percutaneous coronary intervention, doppler ultrasound, fistula repair

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Recurrent Hypercyanotic Spells in Infants with RVOT Obstruction with Right to Left Shunts – A Pathophysiology-Based Treatment Approach

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Background: In cyanotic patients, one of the underlying pathophysiology is right ventricular outflow tract (RVOT) obstruction with shunt. The leading cause of mortality and morbidity in RVOT obstruction with shunt is an episodic central cyanosis due to total occlusion of right ventricular outflow, known as hypercyanotic spell. The presence of spell demands prompt intervention to improve the pulmonary blood flow through proper modalities. This report is aimed to emphasize the importance of pathophysiology-based treatment approach in infants with recurrent spell.
Case Illustrations: Our first patient is a 9 months old girl with hypercyanotic spell in tetralogy of Fallot (TOF) prior to a cardiac CT scan. She tended to be fussy during observation with saturation of 30% even with optimal medication. It was decided to treat her with RVOT stenting. After the procedure, right ventricle and pulmonary artery gradient was reduced from 72 mmHg to 26 mmHg and peripheral saturation was increased from 30% to 89%. Our second patient, an 8 months old boy also came with recurrent spell in TOF, with saturation of 20%. Through the heart team meeting, it was decided to do RVOT stenting in this patient. After the procedure, the peripheral saturation was increased to 97% room air.
Conclusions: Recurrent spell could be managed by several modalities, including medication and intervention, both surgical and percutaneously. In these patients, medications alone could not alleviate the symptoms, hence intervention was needed. Through percutaneous RVOT stenting, patient's saturation was increased from 30% to 89% and 20% to 97%. Patients' outcome was improved and patients were hemodynamically stable.
Keywords: Recurrent Spell, RVOT Obstruction with Shunts, Hypercyanotic spells, RVOT Stents

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Role of ECG in Determination Of Culprit Lesion in Stemi With Multivessel Disease

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Background: ECG interpretation is an essential part of the initial evaluation of patients with symptoms suspected to be related to myocardial ischemia, along with focused history and physical examination. With the angiographic results at hand, the ECG gives important information that helps in identifying the culprit artery in cases of multivessel disease. What is most important is that in the catheterization laboratory, in a patient with STEMI and multivessel disease, the interventionist makes the correct decision as to the coronary artery on which PCI is to be performed.
Case illustrations: In this case we presented a 52-year-old male patient with inferior-dextra STEMI onset of 10 hours Killip I with coronary artery features with multivessel disease during coronary angiography examination in the catheterization laboratory. This case was appointed to discuss the role of the ECG in determining culprit lesions in STEMI patients with multivessel disease.
Conclusions: This case emphasizes the importance of evaluation of the pattern of ST segment deviation in STEMI patients. This is extremely important for not only correctly diagnosing a patient in urgent need of reperfusion but also defining the culprit artery if a percutaneous coronary intervention (PCI) is performed. Correct diagnosis of the culprit coronary artery is critical when considering PCI in a STEMI patient with multivessel disease. In STEMI patients with multivessel disease and coronary angiography who did not show thrombus with total occlusion, the determination of the culprit lesion can be determined using the ECG by measuring the dominance and the injury vector.
Keywords: ECG, STEMI, culprit lesion, multivessel disease

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Safety Of Percutaneous Large Pda Closure In Adults Using Aso Devices: A Case Series

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Background: Transcatheter closure (TCC) of patent ductus arteriosus (PDA) in patients with severe pulmonary hypertension remains a challenging clinical problem. Temporary occlusion of PDA with balloon or device has been in use to decide on contribution of left to right shunt and pulmonary vascular resistance to PAH. Transcatheter closure has been achieved with success using the Amplatzer Duct Occluder (max size 16/14 mm) or even the Amplatzer Muscular Ventricular Septal Defect Occluder (AMVSO). In some patients, the anatomic characteristics of the ducts, with very large diameter or very short length, make them difficult or even impossible to close with such devices. Amplatzer Septal Occluder (ASO) is alternative devices considered in cases of large (⩾8 mm) type C ducts, and in cases with type A ducts where the aortic ampulla diameter is more than 1.5 times the pulmonary end diameter
Case illustrations: Four female adult patients with symptoms of dyspnea on effort and fatigue, physical examinations revealed continuous murmur at infraclavicular line and good peripheral oxygen saturation and normal hemodynamics. Preprocedural preparations include: ECG, chest x-ray and transthoracic echocardiography revealed large PDA with left to right shunt (size), suspected pulmonary hypertension. Interventionist planned for device closure of PDA electively
Conclusions: Large PDA with PH in adult patients that were closed with an Amplatzer septal occluder have short term good results and can be used in some circumstances. We choose a device size similar to the aortic end of the duct. In pulmonary hypertension case, we used the device itself as “balloon occlusion test” and useful to determine the reversibility. No major complications were found 24 hours post procedures but required further follow up
Keywords: transcatheter closure, percutaneous closure, patent ductus arteriosus, ASO device

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Spontaneous Coronary Artery Dissection Complicating STEMI in Young Women : To stent or not to stent

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Background: Spontaneous coronary artery dissection (SCAD) is a rare cause of STEMI but is represents a significant cause in predominantly young to middle-aged women. The diagnosis and management of SCAD remains challenging.
Case Illustrations: We present a case of SCAD presenting as STEMI in a 36-year-old woman. She had no history of traditional atherosclerotic risk factors. She had history of preeclampsia 1 year ago. Electrocardiogram showed ST-elevation in leads V1 to V4. Cardiac troponin was elevated and echocardiography revealed hypokinesia at anterior segment and preserved systolic function (LVEF 53%). Patient was proceed to fibrinolytic therapy then referred to our hospital for further treatment. Coronary angiography (CAG) revealed occlusion at the mid-segment of the LAD with contrast staining, while the RCA and LCx were normal. She proceeded to PCI at LAD and performed OCT to evaluate the lesion. Floppy wire was inserted to distal LAD, multiple predilatation with SC balloon 2,5x20mm. OCT revealed intramural hematoma 2.5x30mm causing compromise of the true lumen and medial dissection at proximal LAD. Then predilation with NC scoring balloon 2.5x20mm. Stenting DES 3.0x38mm at proximal-mid LAD. OCT evaluation revealed well expanded and well apposed stent, hematoma and dissection was coverd by stent. At 1 month follow up, coronary angiography revealed completely resolution of SCAD and she had no symptom. SCAD is an infrequent and often missed diagnosis among patients presenting with acute coronary syndrome. In cases where revascularisation is necessary, PCI is generally preferred over CABG if technically feasible. OCT provides detailed morphology of the lumen coronary artery including entry tear, intimomedial flap, double-lumen morphology, intramural hematoma, and associated thrombus.
Conclusion: Diagnosis and management of SCAD remains challenging because CAG is imperfect, OCT provides detailed visualization compared with other imaging modalities and may increase the diagnostic yield as well as guided treatment strategy.
Keywords: Spontaneous coronary artery dissection, STEMI, women, stent

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

STEMI in the Very Young: A Case Report

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Background: ST-elevation myocardial infarction (STEMI) in the young is rare – estimated to be less than 2% – but it may have substantial impact on patients' quality of life.
Case illustrations: Twenty-two years male presented with recurrent chest pain for 3 days. Chest pain was felt on exertion, described as tightness that lasted for >30 minutes. Pain was felt on the sternum and radiated to the posterior and left side. Pain intensity increased progressively and did not subside with rest. The patient smokes half a pack of cigarettes per day. The patient was haemodynamically stable. Electrocardiogram showed ST-elevation on leads V2 and V3 (Figure 1). Patient underwent percutaneous coronary intervention, coroangiography showed proximal stenosis up to 90% on the left anterior descending coronary artery and a stent was placed (Figure 2). Previously published studies reported smoking and male gender as the most common risk factors, which were the only risk factors present in this case.(1–6) It has been suggested that smoking affect all phases of atherosclerosis due to increased oxidative stress.(7) Interestingly, this patient was much younger compared to mean age from previous studies which ranges from 26 to 32 years.(1–6) Whether the main pathophysiology of STEMI in this case is largely attributable to smoking or due to other mechanism remains unclear. However, this case shows that STEMI can occur in the patients even younger than previously reported mean age.
Conclusion: Although uncommon, STEMI can occur in young patients, especially in males and smokers, hence should always be considered as a differential diagnosis.
Keywords: STEMI, young

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

STEMI with Coronary Artery Aneurysm: Challenging Management

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Background: Coronary Artery Aneurysm (CAA) defined as a localized irreversible dilatation of a coronary by at least 1.5 times the diameter of the adjacent normal segment. It is a rare condition, which occurs 0,3-4,9% of patients undergoing coronary angiography. The association between CAA and STEMI is seldom seen in clinical practice. Primary PCI in this patient is also challenging because the need of rapid flow restoration with angioplasty in the presence of extensive thrombus, thin tunica layers of aneurysm, unrecognizing dissection, which could potentially lead to fatal outcome.
Case illustrations: This case examines the case of Infero-posterior and RV infarct STEMI of 56-year-old man, who felt severe chest pain and dyspnoea for 30 minutes and immediately admitted into ER. He had dyslipidaemia as a risk factor. Vital sign showed BP 78/39 mmHg, HR 66 bpm, RR 24 x/min, O2 saturation was 98% on 3lpm oxygen. The ECG monitor showed sinus rhythm. The Angiography revealed total occlusion in proximal of RCA. There was multiple aneurysm showed after TIMI flow 3 was achieve by several procedures including upgrading wire to Fielder XT-A, support by balloon and microcatheter, 5 times of thrombosuction, complicating by bradycardia and VT. Finally, the stent was successfully implanted in mid RCA, between two aneurysm.
Conclusions: In STEMI with TIMI flow 0, there was difficulty to recognize the aneurysm. The stent should be placed appropriately and proper procedures are needed to achieve a satisfying result without major complication
Keywords: STEMI, coronary artery aneurysm

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Stent Migration during Inter-atrial Stenting, a Pitfall to Overcome

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Background: An adequate interatrial communication is crucial to maintain the hemodynamics in complex congenital heart diseases where left atrial decompression, inter circulatory mixing, and maintenance of cardiac output are dependent on the size of the atrial septal defect. In comparison to balloon septostomy, interatrial stenting provides a controlled, predictable, and long-lasting atrial communication. However, complications may occur during this procedure, such as stent migration, which is potentially fatal complication. Choosing the appropriate technique to overcome this hazardous situation is crucial in managing such complication. This case aim to describes the possible and successful technique to overcome stent migration in inter-atrial stenting
Case illustration: Two month old baby with mitral atresia, double outlet right ventricle, muscular ventricular septal defect, restricted patent foramen ovale. 10x19mm Omnilink Elite Vascular stent was deployed at the inter-atrial septum. Unfortunately, the stent was migrated in to the right atrium. Then we put another stent (10x29mm Omnilink Elite Vascular) proximal to the swimming stent with overlapping technique and inflated up to maximum size (16 atm). The stent was properly placed in the inter-atrial septum. Oxygen saturation was increased from 52% to 81%. Stent migration can happen as a complication during inter-atrial stenting. Several techniques are reviewed to salvage this hazardous situation. We decided to do the overlapping technique to successfully re-positioned the migrating stent in the interatrial septum. This technique can be performed safely and evaluation after procedure using echocardiography showed no obstruction in the pulmonary vein, SVC, IVC, and tricuspid inflow.
Conclusion: Overlapping technique has been shown to be successful and safe in managing stent migration in inter-atrial stenting in this patient.
Keywords: inter-atrial stenting, stent migration

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

TEE-guided Percutaneous Closure of ASD Without Fluoroscopy in Body Weight <10kg: Feasibility of a New Strategy

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Background: Transcatheter closure has been the first choice in the treatment of atrial septal defect (ASD) with appropriate morphology. However, concern has been raised about procedure-related adverse events especially in small patients with low body weight.
Case illustrations: A 6 months old baby girl was diagnosed with secundum ASD and Down Syndrome (DS) and got routine medications at a regional heart centre. She was referred back for her persistent failure to thrive at the age of 3 years and 2 months old. Transthoracic echocardiography (TTE) evaluation showed centrally located ASD 8-10 mm, suitable for transcatheter closure. The procedure was successfully done without fluoroscopy merely guided by TTE using Cera occluder device (Lifetech Scientific Corporation). A week follow-up showed the device was beautifully seated without shunt residual, no pericardial effusion nor adjacent cardiac structure damages. Her body weight was increasing from 8 kg to 8.6kg.
Conclusions: This case has shown that transcatheter closure of ASD without fluoroscopy, TTE guided only is feasible and safe.
Keywords: TEE, percutaneous closure, ASD, fluoroscopy

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

The Important Role of Manual Aspiration through Catheter after Percutaneous Mechanical Thrombectomy (Angiojet) in Patient with Subacute Limb Ischemia due to Essential Thrombocytosis

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Background: essential thrombocytosis (ET) is a myeloproliferative neoplasm characterized by increased platelet count and excessive large and morphologically mature megakaryocyte in the bone marrow. ET may be complicated by thrombosis events, mostly in small and medium vessel. However there are limited evidence to guide management, particularly in cases with acute tissue ischemia. Understanding the basic pathophysiology concept of thrombosis in patient with ET is vital in choosing the right modality for revasculatization.
Case illustrations: A 73-year-old female with history of essential thrombocytosis presenting with chief complaint severe debilitating pain on her right lower extremity. Physical examination showed pulselessness and decreased peripheral saturation. Laboratory review reveals extreme thrombocytosis (>1.800×10^9/L). Blood smear was notable for increased large mature megakaryocytes. Bone marrow evaluation reveals an increased thrombopoietic activity and support the diagnosis essential thrombocytosis. We performed Dupplex Ultra Sound to confirm the diagnosis and found total thrombus at femoral artery dextra, no flow at popliteal artery, tibial anterior and posterior artery. We decided to perform revascularization. Histopathological evaluations of arterial thrombi in ET revealed platelet-rich clots with abundant von Willebrand factor (VWF) and very little fibrin. Hence thrombolysis agent used in CDT will not effective.
Conclusions: Percutaneous mechanical thrombectomy using large hole catheter aspiration is effective as adjunctive treatment if Angiojet thrombectomy is not effective, especially in patient with Limb Ischemia due to Essential Thrombocytosis.
Keywords: manual aspiration, percutaneous mechanical thrombectomy (angiojet), essential thrombocytosis, subacute limb ischemia

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

The Not-So-Typical Case of Acute Myocardial Infarction: 28 Years Old Male with Myeloproliferative Neoplasm

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Background: Myeloproliferative Neoplasm (MPN) is a hematological disorder known for its thrombosis complication, which could lead to ST-Elevation Myocardial Infarction (STEMI). Study shows that thrombosis in MPN accounted for 41% death, with coronary heart disease as the leading cause. The exact pathophysiology of thrombosis in MPN is still unknown.
Case Illustration: A man of 28 years old presented to Emergency Room with chest pain radiating to left arm 20 minutes ago, while he was cycling. The pain was accompanied by shortness of breath, diaphoresis and nausea. There is no known family history and no risk factors of cardiovascular disease. 12-lead ECG showed ST Segment elevation in inferior leads and the diagnosis of Inferior STEMI was made. However a highly elevated platelet count detected on complete blood count studies showed a rather quaint situation. The patient had an episode of VF and successfully defibrillated before underwent primary PCI. Coronary angiography showed thrombosis in proximal to distal RCA with TIMI flow 1. Intervention with POBA and direct injection of intracoronary eptifibatide were done, successfully restored RCA TIMI flow to 2-3. Further studies describe a myeloproliferative neoplasm on bone marrow study, which is then confirmed by detection of JAK2-V617F gene mutation.
Conclusion: STEMI in young adult without previous cardiovascular risk factors is not an everyday stroll. Thrombosis, which in this case is caused by hypercoagulable state, could be the main culprit of AMI. We should be aware of the management of STEMI in hypercoagulable state.
Keywords: Myocardial infarction, thrombosis, myeloproliferative neoplasm, young

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

The Pivotal Role of Transcatheter Interventions in Pulmonary Atresia with Intact Ventricular Septum

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Background: Pulmonary atresia with intact ventricular septum (PA-IVS) is a condition with relatively high complexity and heterogeneity. Management of patients with PA-IVS through biventricular, one-and-a half, or singe ventricular repair has to be individualized. Patients with PA-IVS eventually will need an intervention, either a catheter based intervention or surgical procedure which will be influenced by several variables. To discuss a case of PA with IVS and the expanding role of transcatheter intervention to overcome this condition.
Case Illustration: A one month female baby with PA-IVS and patent foramen ovale (PFO) came to the emergency room of National Cardiovascular Centre Harapan Kita (NCCHK) with bluish discoloration on the body. Patent Ductus Arteriosus (PDA) stenting (in December 2013), Pulmonary valvulotomy with Radiofrequency assisted Pulmonary valve ablation (RFA) followed by BPV (in December 2013), the second BPV procedure (in October 2014) and PFO closure (in November 2018) have been performed in this patient. The outcomes were satisfactory even without surgical approach. These included an increase in peripheral saturation from 17% to 100% as well as no bluish discoloration appeared in patient and increased functional capacity.
Conclusions: Complete repair is achievable solely through catheter-based intervention in a complex congenital heart disease, such as PA-IVS, as an alternative choice besides surgery.
Keywords: Pulmonary atresia with intact ventricular septum, PDA stenting, Pulmonary Valvulotomy, BPV, PFO closure, transcatheter

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

The Worst Nightmare in Percutaneous Coronary Intervention: Severe Coronary Perforation When There Is No Cover Stent

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Background: One of the rare and potentially fatal complications of PCI is coronary artery perforation. These complications can lead to life-threatening cardiac tamponade. The incidence of coronary perforation ranges from 0.2% to 0.6%. The development of cardiac tamponade was associated with poor outcomes with a high mortality reported incidence rate of 33% and a mortality rate of 25%.
Case illustrations: A 55 year old man. who presented to the emergency department complaining of typical chest pain of myocardial infarction. The ecg results showed acute ST elevation myocardial infarction anterior and we planned primary pci.
Conclusions: Although the frequency of coronary perforation is low, it is a serious and potentially life-threatening situation. Need prompt recognition and management. Homemade cover stent can be useful for saving lives when there is no factory cover stent
Keywords: percutaneous coronary intervention, coronary perforation

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Thinkin' Out Loud

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Background: Dealing with complex and critical cases especially in this COVID pandemic era is not easy. There are many things that we should considered before deciding to do intervention procedure. Thankfully, there are many advanced device that help us to do the job. The introduction of the resting, diastolic wave-free period led to both physiologic and practical controversy. But lately, several studies demonstrate numerical equivalency despite differing physiologic and technical details, thereby making physiology more universally accessible. Recent trials showed benefit of dFR in evaluation of coronary physiology, and offers numerical equivalency to iFR or other physiology parameters. IVUS imaging has already established as reliable examination to guide us to optimize the intervention procedure, even in difficult situation.
Case Illustrations: A fifty-one year-old, ACS male patient was referred with severe chest pain and episodes of seizure prior arrived at other hospital. Cardioversion performed for ventricular tachycardia at that time. Patient arrived with cardiogenic shock, SCAI Shock Stage C. Intra-Aortic Balloon Pump (IABP) was inserted, further coronary angiography was showed diffuse intermediate stenosis and unclear culprit lesion founding. Recurrent ischemic VT still occurred in ICCU, even with optimal anti- arrhythmia medicine. Functional examination using DFR (Diastolic wave-Free Ratio), followed by IVUS imaging (Intravascular Ultrasound) guided PCI was performed successfully in determined and treating the lesion which immediately relieved the symptoms and hemodynamic subsequently.
Conclusions: In patient with acute coronary syndrome, malign arrhythmia and cardiogenic shock was predictor for worse outcome, therefore fast examination and treatment must be done correctly to restore the hemodynamics. Coronary angiography result did not convince us to do the intervention (PCI). Recurrent Ischemic VT made us to think more beyond conventional treatment, and so we performed functional and imaging procedure for PCI optimization. In our knowledge, this is the first case DFR guided PCI in IABP (post CS) patient, with IVUS optimization, ever reported.
Keyword: *cardiogenic shock, ventricular tachycardia, intra-aortic balloon pump, diastolic wave-free ratio (DFR), Intravascular Ultrasound*

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Three-Dimensional Echocardiographic Guidance Of Percutaneous Atrial Septal Defect Closure

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Background: Interventional closure of atrial septal defects (ASD) with a transcatheter device is the preferred strategy in children and adult. This procedure has been proven in numerous studies, but X-ray dan contrast agent exposure is still a mayor side effect. Transcatheter closure is the treatment of choice for atrial septal defect (ASD), It has good efficacy and minimal complications. Proper device size selection is crucial step for successful ASD device closure. Three-dimensional echocardiography has significantly improved anatomic assessment and the end the result itself. It can be identified through a systematic assessment of atrial septum anatomy, locating and measuring the size and shape of defects. Between July 2018 until august 2020 closure ASD with percutaneous transcatheter was 136 cases. The transcatheter procedure is divided into the use of fluoroscopy and zero fluoroscopy. Zero-fluoroscopy was guided by transesophageal echocardiography and three dimensional transesophageal echocardiography and transthoracal echocardiography.
Case illustration: This case is a 16- year old woman with secundum ASD with diameter 28 mm. Transcatheter closure was successfully performed with cera (lifetech) ASD occlude no 32 mm, it guided by three dimensional transesophageal echocardiography. There was no other major or minor periprocedural complication. Transcatheter atrial septal defects (ASD) closure has been widely used an alternative to surgical closure in specific cases with excellent longterm result. Selection of the appropriate device size is considered the corner stone for successful procedure, as under or over sizing may cause complication such as device embolization or laceration of adjacent structures. The current gold standard for device selection is balloon sizing, balloon sizing can be tedious, time consuming and increase fluoroscopy and procedure times. Three dimensional transesophageal echocardioraphy can provide a simple and accurate method for device size selection in patient undergoing ASD device closure**.**
Conclusion: Three dimensional transesophageal echocardioraphy can provide a simple and accurate method for device size selection in patient undergoing ASD device closure
Keywords: atrial septal defects, Transcatheter zero-fluoroscopy, Three dimensional transesophageal echocardioraphy

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Transcatheter Closure Of Doubly Committed Subarterial Ventricular Septal Defect -In Not A Conventional Way : Initial Experience In National Cardiovascular Center Harapan Kita

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Background: Advances in interventional techniques now allow for transcatheter closure of doubly committed subarterial ventricular septal defect (DCSA VSD) leading to signifant paradigm shift of management. Limited experience with fluoroscopic technique was reported. Here, we report our initial experience the feasibility and safety of transcatheter closure of DCSA VSD in not a conventional way- zero fluoroscopic procedure.
Case Illustrations: From July to October 2020, a total of 5 DCSA VSD patients underwent transcatheter closure and 3 patients was successfully done with zero fluoroscopic procedure at National Cardiovascular Center Harapan Kita (NCCHK). The patients mean age was 21.8±20.6 years old (3–56 years old), and mean body weight was 32.8±21.5 kg (15-68 kg). The median VSD size from TEE was 3.6 mm (2.5–4 mm), and the mean size of the occlusion device was 7±0.8 mm (6–8 mm). Three cases were successfully done by retrograde approach and one case switch to fluoroscopy procedure. The mean procedural times were 40.8±33.3 minutes (30-77 minutes). Only 1 unsuccess case related to anatomical factor.Device displacement, pericardial effusions, arrhytmia, residual shunt or new valve regurgitation were not observed during and after procedure. The patients showed significant clinical improvement after the procedure.
Conclusions: Transcatheter closure of DCSA VSD in zero fluoroscopic technique is technically feasible, further study is needed to confirm its long-term clinical outcomes.
Keywords: doubly committed subarterial ventricular septal defect, zero-fluoroscopic, outcome

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Transient ST elevation in young adult: STEMI, Covid-19 Myocardial Injury, or Myocarditis?

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Background: Myocarditis remains one the biggest diagnostic challenge in cardiology. One of ECG features of myocarditis is ST Elevation. Myocarditis associated ST elevation provide a real challenge especially in this pandemic Covid-19 situation.

Case Illustrations: An 18-years-old male with unremarkable clinical history was referred to our hospital for primary PCI with diagnosis of anterior wall STEMI. His chief complaint was chest pain. The chest pain was anginal in quality, radiates to left arm, lasted for >30 minutes, and accompanied by sudden dyspnea. He also had fever and cough for 7 days. There was no history of cocaine abuse. Clinical findings were Blood pressure 110/60 mmHg with dobutamine 9 mcg/kgBW/min, heart rate 99 bpm, oxygen saturation 99% with oxygen supplementation, and systolic murmur best heard on apex. The ECG showed ST elevation on lead V3 to V4. Laboratory results were elevated troponin I, high CRP, lymphopenia, thrombocytopenia, and increased N/L ratio. Chest radiography revealed pneumonia. Coronary angiography was performed, and his angiography was unexpectedly normal. Echocardiography showed reduced LV contractility, mitral regurgitation, and regional wall motion abnormality. The patient was diagnosed with Covid-19 associated myocardial injury with possibility of viral or bacterial myocarditis. A Covid-19 serial PCR test was performed with negative result. The diagnosis of myocarditis was established.
Conclusions: Etiology of ST Elevation in Covid-19 pandemic requires more careful approach from clinician before making a diagnosis, especially if accompanied by history of cough and fever. Myocarditis, Covid-19 myocardial injury, and STEMI almost have similar clinical presentation, ECG, and laboratory features.
Keywords: Myocarditis, STEMI, Covid-19 myocardial injury, Coronary angiography

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Vascular Thrombosis in A 22 Years Old Woman with Systemic Lupus Erythematous (SLE): Thromboangiitis Obliterans (TAO) or Antiphospholipid Syndrome (APS)?

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Background: Antiphospholipid Syndrome (APS) defines as a predisposition for arterial and/or venous thrombosis in association with hematological abnormalities and specific antibodies targeted against phospholipid-binding plasma proteins. Thromboangiitis Obliterans (TAO) is a nonatherosclerotic, segmental inflammatory disease that most commonly affects the small and medium-sized arteries and veins in the upper and lower extremities. Although TAO is a type of vasculitis, it is distinct from other vasculitis. The immune system seems to play a critical role in the etiology of TAO. However, knowledge about immunological aspects involved in the progression of vascular tissue inflammation, and consequently the evolution of this disease, is still limited.
Case Illustrations: A 22-year-old woman presented with a black discoloration on her pinky finger of the right hand. Initially, she has noticed it for 2 years earlier. The patient denied Hypertension, history of Ischemic Heart Disease, and Diabetes Mellitus. The patient was a secondhand smoker. However, the patient had a history of Systemic Lupus Erythematous (SLE) for five years. The patient was diagnosed with SLE due to findings of mouth sores, malar rash, and photosensitivity. ANA-IF was tested positive with 166.8 units. The patient routinely consumed Aspirin, Cyclosporine, Methyl Prednisolone, Diltiazem, and pain relievers. On examination, resting pain on the fourth and fifth digiti of the right hand was found. The sensory and motoric examination of the patient's right fingers showed no abnormalities. Black-colored gangrene was found on the fifth digiti of the right hand.
Conclusions: SLE is an autoimmune disorder affecting multiple organ systems. Vascular damage in SLE occurs through vasculitis, premature atherosclerosis, hypercoagulability due to antiphospholipid antibodies and high homocystine levels. Vascular involvement in SLE may be cause of inflammatory or thrombotic origin. Both mechanisms involve the immune system. The activation and consequent endothelial lesions play a very important role in disease pathogenesis. Understanding of the vascular abnormalities and the underlying pathogenesis process is clearly important for providing new insights into the treatment in vascular manifestations of SLE.
Keywords: Tromboangiitis Obliterans, Antiphospholipid Syndrome, Systemic Lupus Erythematous

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Ventricular Septal Defect (VSD) Closure with Multiple Device

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Background: Ventricular septal defect (VSD) ranks most of all congenital heart diseases approximately 34-37% but in contrary, VSD with multiple defect is rare. Management of patients with multiple defect VSD has to be individualized. Patients with multiple exits VSD eventually will need an intervention, either a catheter based intervention or surgical procedure which will be influenced by several variables. To discuss a case of VSD closure with multiple device and the expanding role of transcatheter intervention in this condition.
Case Illustration: A five years old girl with multiple defect VSD referred to the outpatient clinic of National Cardiovascular Centre Harapan Kita (NCCHK). Echocardiography finding showed perimembranous VSD with MSA and multiple exits 3 mm and 2.7 mm, L - R shunt. VSD closure with multiple device (in March 2020) have been performed in this patient. The outcomes were satisfactory even without surgical approach.
Conclusions: VSD closure with multiple device is achieved through catheter-based intervention as an alternative choice besides surgery.
Keywords: *Ventricular septal defect (VSD), VSD closure with device, transcatheter, multiple VSD.*

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Zero Fluoroscopic Closure of Secundum Atrial Septal Defect With Multiple Rim Deficiency: Report Of Our First Experience In Saiful Anwar Hospital, Malang

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Background: Atrial septal defect (ASD) is the most common congenital heart diseases affecting children and adult. Transcatheter closure is the treatment of choice for ASD. Evidence shows transcatheter ASD closure is beneficial in patients with hemodynamically significant secundum type ASD. To the best of our knowledge, this was the first successful fluoroscopy-free technique for transcatheter ASD closure in Malang.
Case illustrations: The case is a 19-year-old male with secundum ASD and pulmonary hypertension. Despite complete deficiency at aorta rim, and deficient at inferior rim we tried to attempt for device closure with surgery back up planned. Transcatheter closure was successfully performed with a Cera ASD occluder (Lifetech Scientific Corporation) no. 40 mm guided by transesophageal echocardiography by LUPV Approach. There were transient junctional rhythm was reported during procedure. Patient was discharged without further complication.
Conclusions: the transcatheter closure of an ASD without fluoroscopy is feasible, safe, and effective. However, in the present of multiple rim deficiency there are still conflicting data regarding the feasibility of transcatheter closure.
Keywords: ASD, Trancatheter Closure, TEE

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Zero Fluoroscopic Transcatheter Ventricular Septal Defect Closure guided by Transthoracal Echocardiography only

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Backgrounds: In recent years, transcatheter device closure for ventricular septal defect (VSDs) totally guided by transesophageal echocardiography (TEE) with zero fluoroscopy has been used in our center. Transthoracal echocardiography (TTE) is also a promising modality to be used as a guidance in this setting. These case aims to describe the effectiveness and safety of transcatheter VSD closure totally guided by TTE only.

Case illustration: 1 year old female patient with perimembranous VSD came to our center to undergo transcatheter VSD closure. From the echocardiography, the VSD was 7 mm, left to right shunt, with membrane septal aneurism, mild mitral regurgitation, and mild relative pulmonary stenosis. We closed the defect with retrograde trans-arterial approach and guided by TTE only. The device (Konar-MF VSD occluder Lifetech no.7/5mm) was deployed successfully, with only mild central residual shunt, and no increase in mitral regurgitation severity. Transcatheter device closure of VSDs totally guided by TEE has been frequently used in recent years. During the procedure, the imaging of VSDs by TEE plays a crucial role. TEE use may encounter several disadvantages, including the increase of anaesthetic dose, possibility of mechanical intubation, and oropharyngeal impairment. A study in 2013 concluded that TTE was as efficacious and safe as TEE for assessment and guidance of VSD closure. Therefore, in this patient, the VSD in this patient was successfully closed under TTE guidance alone, with

Conclusions: We report our first case of zero fluoroscopic transcatheter closure of VSD under total guidance of transthoracic echocardiography.

Keywords: *transcatheter VSD closure, transthoracal echocardiography*

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Zero Fluoroscopy Transcatheter ASD Closure in a Patient with Intractable Heart Failure

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Background: Atrial septal defect (ASD) is a congenital heart disease that leads to chronic volume overload. A concomitant severe mitral regurgitation (MR) may augment volume overload, causing the heart to decompensate earlier thus results in intractable heart failure (HF), on the contrary to the regular ASD patient. This condition requires an intervention to overcome the source of the problem, besides optimum medication. This report aims to present the role of zero fluoroscopy transcatheter ASD closure in pediatric patient with ASD with intractable HF.
Case Illustration: A 13-year-old girl was re-admitted to the hospital with secundum ASD, PH, severe MR due to AML prolapse, and severe tricuspid regurgitation (TR) with intractable HF despite optimum medical therapy. Echocardiography revealed oval shaped secundum ASD with the size of 19 x 33 mm, left to right shunt, with intra-atrial septal length of 53 mm, severe MR due to AML prolapse, severe TR with TVG of 50 mmHg, and mild pericardial effusion. The patient was administered continuous furosemide infusion of 5 mg/hour, dopamine 2.5 mcg/kg/minute, ramipril 1x5 mg, and bisoprolol fumarate 1x0.625 mg. The patient was decided be performed zero fluoroscopy transcatheter ASD closure using MemoPart ASD Occluder No. 36 mm with LA approach, while having continuous furosemide infusion afterwards. The patient was in stable condition and echocardiography evaluation revealed that the device was stowed in placed. She was performed a six-minute walk test with excellent result before being discharged 3 days afterwards. The patient was in stable condition without any congestive symptom during outpatient clinic follow up.
Conclusion: Zero fluoroscopy transcatheter ASD closure was effective in treating intractable heart failure due to ASD besides its minimal effect of radiation.
Key words: pediatric, atrial septal defect, intractable heart failure, zero fluoroscopy, transcatheter atrial septal closure

Indonesian Journal of Cardiology
Indonesian J Cardiol 2020:41:suppl_B
pISSN: 0126-3773 / eISSN: 2620-4762
doi: 10.30701/ijc.1088

Zero-Fluoroscopy Ballon Pulmonary Valvuloplasty : First Experience in Indonesia

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Background: Ballon pulmonary valvuloplasty (BPV) is indicated in severe valvular PS. This is the first zero-fluoroscopy guidance balloon pulmonary valvuloplasty in Indonesia.
Case Illustrations: Patient was a 17 months old child with secundum atrial septal defect (ASD) with severe valvular pulmonary stenosis (PS) with good result. The procedure was performed under general anesthesic. Technique with zero-fluoroscopy transesophageal echocardiography (TEE) guidance from mid-esophageal, bicaval view, 4-chamber and short axis view. Guiding with JR 3.5/5 F catheter from inferior vena cava (IVC) to right atrium (RA) with hydrophilic wire 0.05 assisted. Then advancing wire to right ventricle (RV). After catheter in RV, catheter pulled and rotated clockwise until catheter tip to RV outflow tract. Then, advancing catheter to main PA (MPA) with pressure tracking method. Catheter was replaced by stiff wire to the edge of MPA. The catheter must be ensured straight from MPA, RV and RA. The PV annulus diameter is 14 mm, then we planned introduced Thysak Balloon 2.0 size 18 mm to pulmonary valve (PV) annulus. Balloon was inflated twice right at PV annulus until balloon waist disappeared. The procedure was performed in 65 minutes without radiation dose. The patient RV-PA gradient before procedure was 45 mmHg, after procedure there was gradient reduction to 24 mmHg.
Conclusions: Ballon pulmonary valvuloplasty (BPV) is indicated in severe valvular PS. The case presentation highlighted the first procedure of zero-fluroscopy BPV technique with TEE guidance. The procedure can be performed with TEE guidance with good result.
Keywords: Zero-fluoroscopy ballon pulmonary valvuloplasty