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CORONARY CALCIUM IN THE CATH LAB – HOW TO IMAGE WISELY?

Dr Pradeep Kumar Hasija, Chennai

- Coronary calcium requires accurate quantification for selecting appropriate therapy to ensure adequate stent implantation and optimal long- and short-term outcomes.
- Calcium imaging in cath lab by coronary angio alone is not adequate, and accurate assessment depends on intravascular ultrasound (IVUS) or optical coherence tomography (OCT).
- IVUS has higher tissue penetration useful to assess deep calcium, and OCT has a higher resolution for better quantification.
- OCT has higher sensitivity compared with IVUS in detecting both stent malapposition and under expansion. Future efforts should target consensus imaging guidelines.

AMBULATORY BP MEASUREMENT: HOW TO INTERPRET THE DATA?

Prof (Dr) Anjan Lal Dutta, Kolkata

Ambulatory BP monitoring (ABPM) displays 24-hour BP flow and HR dynamics that is particularly helpful to explain the disparity between BP level and end-organ damage in WCH, MH, Noct. Dippers/Nondippers early morning BP surge. It also helps assess BP variability, treatment response and treatment resistance. However, the proper utility of ABPM depends on proper data collection with a competent operator, patient's cooperation and quality of the device system.

CASE IN THE BOX: LEFT BUNDLE PACING – TIPS AND TRICKS

Dr Shunmuga Sundaram Ponnusamy, Madurai

Left bundle branch pacing is a recent innovation in the field of physiological pacing to overcome the limitations of his bundle pacing. Provides electrical and mechanical synchrony avoiding RV pacing related complications. It can be performed with or without EP setup by the deep placement of a 4.1 F sized lead in the proximal interventricular septum. Provides excellent lead stability and pacing parameters; Can be used as an alternative to conventional RV pacing. Left bundle branch pacing is an effective alternative to cardiac resynchronization therapy.

MINOCA – WHAT NEXT?

Dr Smit Shrivastava, Raipur

Myocardial **I**nfarction with **N**ormal **C**oronary **A**rtery. Every sixth to ninth myocardial infarction is MINOCA. Young and female are at more risk. A coronary angiogram misses 95% of the coronary circulation. MINOCA can have multiple potential mechanisms for causation – Vasospasm, dissection, myocardial dysfunction. Cardiac MRI can pick up the underlying cause in 87% of MINOCA. Treatment with statin and RAAS blocker benefits MINOCA. Only a LAZY CARDIOLOGIST would not investigate further or a CRAZY CARDIOLOGIST!

STRESS CARDIOMYOPATHY – NEWER INSIGHTS

Dr VK Katyal, Rohtak

Stress cardiomyopathy (TAKOTSUBO cardiomyopathy) develops in postmenopausal females with acute mental or physical events. Presents like acute coronary syndrome (ACS) often with complicated course with sudden death. Characteristic ECG changes with elevated troponin-I and natriuretic peptides are highly suggestive of Takotsubo syndrome. INTERTAK diagnostic score identify large no. of patients correctly. 2D echocardiography criteria has largely replaced invasive workup. Management depends upon type of involvement with LVOTO and MR posing difficulties in management with attendant cardiogenic shock.

BEST INDICATIONS FOR INTRACORONARY IMAGING

Dr Lorenz Raber, Switzerland

Stent failures, ambiguous ACS patients, intermediate left main stenosis, percutaneous coronary intervention (PCI) guidance for complex lesions (long lesions, LM, CTO, 2-stent bifurcation) represent key indications for IC imaging that are also supported by guidelines, consistent clinical benefits can be expected for PCI guidance, improved precision in the diagnostic workup.

DYSLIPIDEMIA

Prof Lale Tokgozoglu, Ankara

- Low-density lipoprotein (LDL) cholesterol is causal for cardiovascular disease (CVD) and the primary target. New ESC/EAS dyslipidemia guidelines recommend lower LDL goals. The guidelines suggest at least 50% reduction in LDL from baseline.
- Statins are the first-line of treatment while second-line of treatment includes ezetimibe, proprotein convertase subtilisin kexin type 9 (PCSK9) inhibitors, bempedoic acid, EPA, fibrates. There is a paradigm shift from high intensity statin to high intensity lipid-lowering.
- We have several existing and new lipid-lowering medications. The real challenge is using them effectively to get to guideline recommended goals and ensuring patient adherence.

CASE IN THE BOX: ISCHEMIC HEART FAILURE-VIABILITY ASSESSMENT

Dr Neha Sekhri, London, UK

- Myocardial stunning and hibernation are points on the same spectrum.
- Viability is still a retrospective assessment of left ventricular function post revascularization.

LDL-BASED MANAGEMENT: TARGET-BASED OR DOSE-BASED

Dr TR Muralidharan, Chennai

- Low-density lipoprotein (LDL) is causal of atherosclerosis – Evidence from meta-analyses of Mendelian randomization studies, prospective cohort studies and randomized controlled trials unequivocally establishes that LDL causes atherosclerotic cardiovascular disease (ASCVD).
- High-dose statin-indefinite use without monitoring: Predictable pharmacodynamics and kinetics; Proven superiority; Preferably without side effects; May be the only drug available.
- Statin therapy is remarkably safe: Typically, treating 10,000 patients for 5 years with a standard statin regimen is expected.
- Achievable reductions of LDL cholesterol as a function of the therapeutic approach: LDL cholesterol-lowering treatment impacts disease progression before clinical manifestation.
- To conclude - Monitor the lipids; Step down is a distant dream; Escalation is a startling reality.

SHOULD BP-LOWERING MEDICATIONS BE TAKEN AT NIGHT?

Prof Neil R Poulter, UK

- Raised BP continues to be the biggest contributor to the global burden of disease and to global mortality. BP control remains inadequate among hypertensives across the globe.
- According to ISH 2020 recommendations, ideal drug characteristics include "use a once daily regimen, which provides 24-hour BP control."
- Nocturnal BP is a better predictor of cardiovascular (CV) events.
- Evidence for nocturnal dosing – There is limited data on nocturnal dosing of BP-lowering drugs.
- Previous observational data suggest nocturnal dosing may give superior CV protection.
- HARMONY trial – In treated hypertensive patients with stable BP levels, the timing of antihypertensive drug administration did not affect mean 24-hour ABPM levels or quality of life.
- Hence, there are no good data to recommend nocturnal dosing.

PRIMARY ANGIOPLASTY (PAMI) IN ECTATIC CORONARIES

Dr Nakul Sinha, Lucknow

Ectatic coronaries (even bordering on aneurysms pose a unique challenge for PCI, more so when they have heavy thrombus burden in settings of acute myocardial infarction (MI). There is no uniform recommendation or guideline that can get a safe and effective outcome in most cases. The basic agreed approach is to use strong antiplatelets, antithrombotics (even consider GpIIb/IIIa inhibitors), and anti-spam measures. The key is to get the residual thrombus burden as low as possible (easier said than done). Early stenting or where there is an enormous thrombus burden can lead to stent thrombosis. The aim is to be able to get a good antegrade flow and maintain it! Do not aim for perfection but a reasonably good flowing vessel.

SHOULD WE RESTRICT TOTAL FAT FOR CVD PREVENTION?

Dr Ajay K Sinha, Patna

Reduce total fat intake to optimize types of dietary fat. Elevated consumption of saturated fats in the

diet would not be detrimental to CV risk and would not increase all-cause mortality. Mediterranean diet has shown a decrease in morbidity and mortality. New recommendations should emphasize food-based strategies that translate for the public into understandable, consistent and robust recommendations for healthy dietary patterns. Evaluating drugs is easy; assessing the healthfulness of food is not. Food-based dietary guidelines: No benefit of lowering total dietary fat in food or overall diets. Reducing total fat (replacing total fat with overall carbohydrates) does not lower CVD risk.

STATIN INTOLERANT POST-MI PATIENT – WHAT NEXT?

Dr SS Iyengar, Bengaluru

- Statin intolerance is rare. Statin intolerance is the inability to take statins to achieve the goal of LDL cholesterol either because of adverse effects or elevation of enzymes.
- Treatment of statin intolerance is to restart lower dose of the same statin, use an alternative statin, intermittent statin, low-dose statin *plus* ezetimibe or other nonstatins.

INNOVATIONS FROM INDIA DEFINING A FRESH PATH IN TAVR

Dr Ashok Seth, New Delhi

The Myval transcatheter aortic valve implantation (TAVI) system is designed and manufactured by Meril Lifesciences in India. The Myval valve is a next-generation balloon-expandable heart valve made up of a nickel-cobalt alloy frame and bovine pericardium leaflets. The valve has a unique hybrid honeycomb cell design, with open cells on the upper half to ensure the unjailing of the coronary ostia and closed cells on the lower half for high radial strength. Upon crimping, the design gives a unique "dark and light" band pattern, visible under fluoroscopy, ensuring accurate valve positioning and orthotopic deployment.

LEFT MAIN DISEASE – SURGERY IS THE BEST OPTION IN ALL

Dr OP Yadava, New Delhi

- Left main plaque is complex (Eccentric and heavily calcified) and usually extends into proximal left anterior descending coronary artery (LAD) and circumflex, besides over 90% having associated multivessel coronary artery disease (CAD).
- Associated comorbidities like diabetes mellitus, left ventricular (LV) dysfunction and chronic kidney disease (CKD) should factor in decision-making. Results of surgery are far superior to PCI in these comorbidities, as also when the Syntax score is ≥33.
- Coronary artery bypass grafting (CABG) has a survival advantage over PCI which unfolds on follow-up beyond 5 years and survival curves keep diverging beyond that period.
- EXCEL trial has been challenged as primary endpoint was changed during the trial and the definition of perioperative MI too was changed, thus raising an accusation that this was willfully done to prop-up PCI. Even 38% higher mortality with PCI over CABG was not given due cognizance.
- Off-pump, anaortic, total arterial revascularization is the gold standard treatment for left main stenosis.

PHARMACOLOGIC THERAPY TO REVERSE CARDIAC REMODELING IN HEART FAILURE WITH REDUCED EJECTION FRACTION

Dr Akshay S Desai, USA

- Cardiac remodeling is a key driver of heart failure progression.
- Reverse remodeling can be enhanced by appropriate application of guideline-directed heart failure therapy.
- Both the extent and pace of reverse remodeling are correlated with reductions in mortality and heart events.
- Replacement of angiotensin-converting enzyme (ACE) inhibition with ARNI reduces ventricular volumes and improves left ventricular ejection fraction (LVEF).
- Data regarding remodeling benefits of sodium-glucose cotransporter-2 (SGLT2) inhibitors is emerging.

VASCULAR DOSE OF RIVAROXABAN – EFFECTIVE STRATEGY TO REDUCE THROMBOTIC EVENTS IN POST-STEMI?

Dr Prabhat Kumar, Patna

Despite a great deal of interest in secondary prevention following an ACS, with particular attention on antiplatelet and antithrombotic therapies, the standard of care has remained essentially unchanged for the better part of a decade. Until recently, treatment of atherothrombosis focused on platelets with the use

of single or dual antiplatelet therapy. For secondary prevention, current guidelines recommend low-dose aspirin or clopidogrel if aspirin cannot be tolerated. Dual antiplatelet therapy (DAPT), consisting of aspirin plus a P2Y12 antagonist, is recommended for patients with ACS. Despite the use of single or dual antiplatelet therapy; however, there remains a significant residual risk of serious atherothrombotic events. The limitations of antiplatelet treatment raised the possibility that combining antiplatelet therapy with an anticoagulant might improve atherothrombotic outcomes.

An innovative low-dose of Rivaroxaban regimen (2.5 mg twice daily, known as vascular dose) or 5 mg twice daily was compared with matching placebo on a background of DAPT in phase III randomized trial (ATLAS-ACS-2 TIMI 51 trial) with 15,526 ACS patients for around 13 months, but up to 31 months. Compared with placebo, both doses of Rivaroxaban significantly reduced the primary efficacy endpoint, a composite of cardiovascular death, MI or stroke, by 16% relative risk reduction (RRR). In contrast to the twice daily 5 mg dose of Rivaroxaban, the twice daily 2.5-mg dose reduced the rate of cardiovascular death (2.7% vs. 4.1%, p = 0.002) and all-cause death. The trial does suggest that lower-dose strategies are advantageous in this setting, with the very low-dose group achieving overall better outcomes than the low-dose group. Based on these findings, the 2.5 mg twice daily dose of Rivaroxaban was licensed in Europe for use on top of DAPT in high-risk ACS patients.

Further, the importance of using low doses when direct oral anticogulants (DOACs) are combined with antiplatelet therapy is highlighted by the APPRAISE 2 trial findings. With the benefit of lower doses of Rivaroxaban established, the utility of DPI was evaluated in several phase III studies, the largest of which was the COMPASS trial, where Rivaroxaban was compared on top of aspirin (100 mg once daily) or aspirin alone for secondary prevention in 27,400 patients with stable CAD or peripheral artery disease (PAD).

Suggested Reading

1. Mega JL, Braunwald E, Wiviott SD, et al; ATLAS ACS 2–TIMI 51 Investigators. Rivaroxaban in patients with a recent acute coronary syndrome. N Engl J Med. 2012;366(1):9-19.
2. Alexander JH, Lopes RD, James S, et al; APPRAISE-2 Investigators. Apixaban with antiplatelet therapy after acute coronary syndrome. N Engl J Med. 2011;365(8):699-708.
3. Eikelboom JW, Connolly SJ, Bosch J, et al; COMPASS Investigators. Rivaroxaban with or without aspirin in stable cardiovascular disease. N Engl J Med. 2017;377(14):1319-30.

HOW TO CHOOSE THE IDEAL NOAC FOR VARIOUS CLINICAL SCENARIOS IN AF?

Prof (Dr) Saumitra Ray, Kolkata

- There is no "ideal" non-vitamin K oral anticoagulants (NOAC).
- NOACs vary in their efficacy, PK-PD properties and side effect profile. For stroke and systemic embolism prevention, superiority over warfarin has been proved for 150 mg b.i.d. dose of dabigatran and 5 mg b.i.d. dose of apixaban. Other molecules and other doses are noninferior to warfarin.
- All NOACs are better than warfarin for hemorrhagic complications, especially intracranial hemorrhage.
- Dabigatran is renally excreted and, as such, cannot be used in moderate-to-severe renal failure patients. Rivaroxaban may be used with lower dose and apixaban may even be used with advanced renal failure.
- When compliance is an issue, rivaroxaban scores over others due to its single daily dose.
- Food increases absorption of rivaroxaban, but has little effects with other molecules. On the other hand, drug-drug interaction is more with edoxaban.
- In all situations, regular monitoring for side effects and compliance is needed when a patient is on NOAC.

MY PATIENT ON NOAC FOR A PLANNED CORONARY INTERVENTION – HOW TO MANAGE?

Dr Nagamalesh UM, Bengaluru

Approximately 5-10% of patients undergoing PCI have atrial fibrillation (AF). Combining oral anticoagulation (OAC) with DAPT is a strategy known as triple antithrombotic therapy. Triple therapy is known to increase the risk of bleeding compared with OAC or DAPT alone. Multiple guidelines and consensus documents have been published over the past decade to inform clinicians on the optimal antithrombotic strategy for AF patients undergoing PCI. Long-term treatment of patients on OAC after revascularization: From PCI until Day 14 (max 30 days) NOAC (full AF dose) + aspirin + clopidogrel; Day 15 (day 31) until 12 months NOAC (full AF dose) + clopidogrel; After 12 months in ACS (after 6 months in CCS) NOAC.