Cardio Mag

Volume 1|Issue 6|2020

Dear Doctor,
*Greetings from Micro Labs Limited. We are happy to bring you "**Cardio Mag**", which contains latest and interesting news in the field of Cardiology.*

This issue contains

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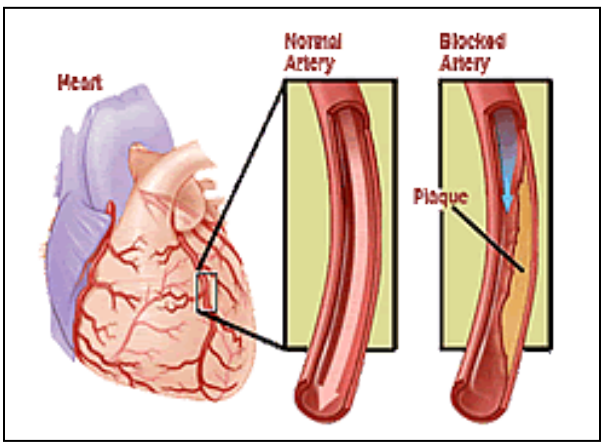
Looking forward to your valuable feedback.
Best Regards,
Medical Team, Micro Labs Limited

1. To assess the Cut-Off Stenosis for Developing coronary Spasm in Patients with Vasospastic Angina



Coronary spasm is a phenomenon that occurs in patients with or without coronary atherosclerosis, can be focal or diffuse, with changing patterns in the same patient , and can affect epicardial or microvasculature coronary arteries.

Vasospasm(VA) occurs at the site of coronary plaque, even minimal atherosclerotic plaque with coronary spasm occurred is reported to be associated with poor prognosis.
Vascular endothelial dysfunction and hyper-reactive vascular smooth muscle (VSM) at the atherosclerotic site could be between vasospasm and atherosclerosis.
Objective of the current study is to evaluate the cut off stenosis for developing coronary spasm in patients with vasospastic angina.

Cardio Mag
Volume 1|Issue 6|2020

Methods:

A prospective study involving 2950 patients received coronary angiography (CAG) and ergonovine provocation test.

A total of 1830 patients with Vasospastic Angina and 820 without VA were included.

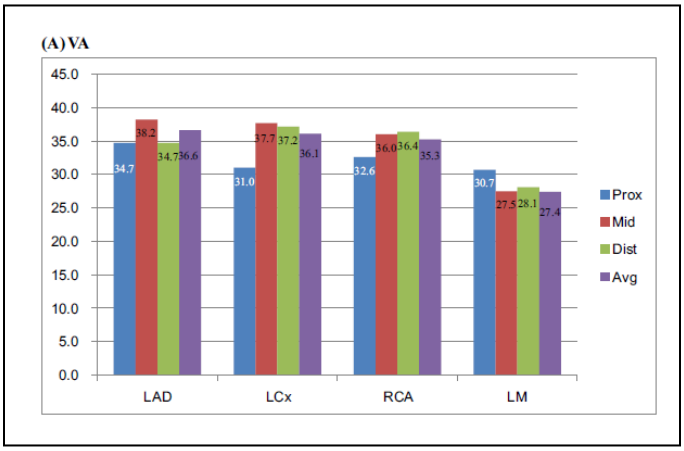
Plaque and percentage of stenosis were defined as ≥1% luminal narrowing and mean of each segmental stenosis. Overall frequency of plaque and percentage of diameter of stenosis was compared among VA-patients with index coronary spasm positive, those with index arterial spasm negative/other arterial spasm positive (INOP) and non-VA patients.

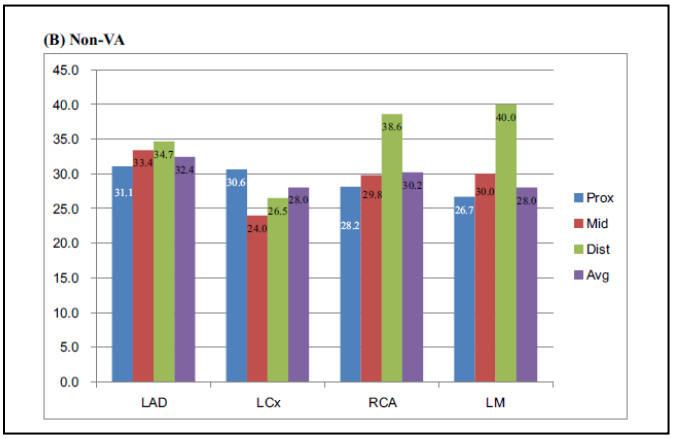
Diameter of stenosis associated with the positivity of spasm was investigated.

Results:

In patients with LAD spasm positive , LAD plaque frequency were 27.6%, 16.4%, 12.2% in that order respectively ($p < 0.001$). In LAD spasm positive patients, LAD plaque diameter stenosis were 38.27 ± 16.54%, 33.99 ± 16.50, 32.43 ± 14.15 with p = 0.002.

In patients with LCx and RCA spasm, a trend for highest plaque parameter in index coronary spasm positive than INOP (index coronary not spastic but other site positive) and non-VA was seen.





Mean lumen narrowing for determining LAD spasm was ≥35% of diameter stenosis with 47.7% sensitivity and 66.4% specificity (Odds ratio [OR] = 1.806, 95% confidence interval [CI] 1.261–2.587, P = 0.001).

For LCx, ≥ 35% of mean % stenosis was ideal for detecting probable spastic coronary artery with 52.9% sensitivity and 71.2% specificity (OR 2.781, CI 1.506–5.138, P = 0.001).

For RCA ≥ 40% stenosis had 36.6% sensitivity and 73.4% specificity with OR 1.596 (95% CI 1.004–2.1539, P = 0.048.

Cardio Mag
Volume 1|Issue 6|2020

Discussion:

Vasospastic angina a variant of angina pectoris, in which angina occurs at rest, with transient ST-segment elevation on the electrocardiogram and preserved exercise capacity.

Current study assessed severity of atherosclerotic plaque and their relationship in VA patient as compared to non-VA patients. It was noticed that VA patients having spasm in any coronary artery were more likely to have overall atherosclerotic plaque in all coronary arteries even in non-spastic artery as compared to non-VA patients. spastic coronary artery are more likely to have plaque, higher plaque percentage of stenosis and larger plaque burden than other coronary artery .

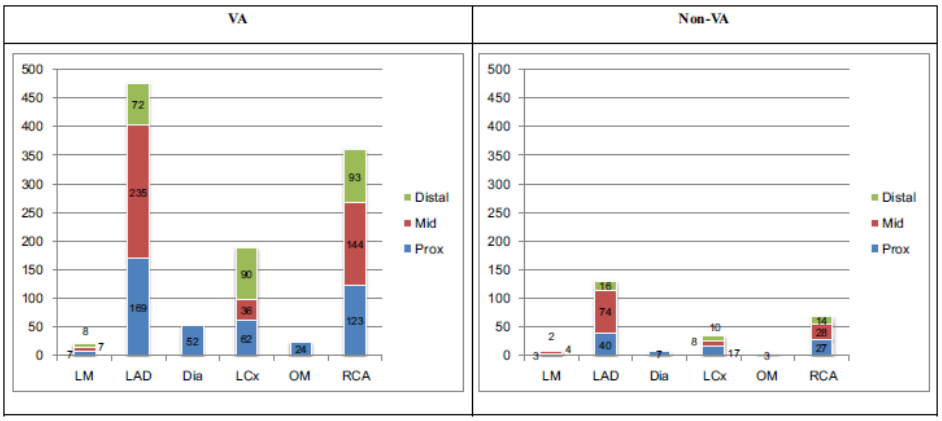


Figure : Atherosclerotic plaque distribution in each coronary segment (lesion based) in VA and non-VA patients groups. Vertical axis indicates plaque number. Numbers in graph indicate lesion count in each segment. Abbreviations: VA, variant angina; LM, left main coronary artery; LAD, left anterior descending coronary artery; Dia, diagonal branch; LCx, left circumflex coronary artery; OM, obtuse marginal branch; RCA, right coronary artery; Distal, distal segment; Mid, middle segment; Prox, proximal segment.

plaque parameters seen were higher in VA patient both in spastic index artery and other coronary artery irrelevant to spasm than those with non-VA patients.

These results are in line with those from previous small sized intravascular ultrasound (IVUS) study. The current study analyzed the plaque with more focus on specific spasm positive coronary artery to compare in-depth with other non-spasm responsible coronary of VA patient as well as coronaries of non-VA patients.

Coronary artery with Spasm positive had more chance to have plaque, higher diameter stenosis and higher plaque burden as compared to matching coronary artery of non-VA patients. Another Interesting finding is that, on comparing with those with index coronary not spastic but other site positive (INOP), the likelihood of having plaque, percentage of stenosis and atheroma burden was highest in index arterial spasm positive, middle in INOP and lowest in non-VA patients.

Similar findings were seen in all 3 coronary arteries. Even the plaque in INOP showed higher or

higher trend than that of non-VA patients consistently.
Investigation revealed that cut-off point of coronary stenosis related to spasm provocation as 35–40% and found this value was independent predictor for spasm. Spasm is very closely linked with plaque.

Conclusion:

Spastic coronary artery had more chances of frequency of plaque formation, increased percentage of stenosis than non spastic coronaries. Coronary stenosis ≥35% in LAD and LCx is an independent risk factor for developing spasm.

Reference:

1) Jo SH, Sim JH, Baek SH. Coronary Plaque Characteristics and Cut-Off Stenosis for Developing Spasm in Patients with Vasospastic Angina. Sci Rep. 2020;10(1):5707. Published 2020 Mar 31.

2. Idiopathic thrombocytopenic purpura with recurrent episodes of acute coronary syndrome – A case report

An autoimmune disorder is Idiopathic thrombocytopenic purpura (ITP) , with presence of low platelet count predisposing to bleeding but paradoxically associated with increased risk of acute coronary syndromes .
Here is a case presentation with diagnosed ITP for first time and recurrent ACS.

Case presentation

A 58-year-old man was diagnosed with acute myocardial infarction without ST elevation (NSTEMI). As it was first-diagnosed as thrombocytopenia (platelet count (PLT) 50.000/µL), conservative treatment was planned with single antiplatelet therapy (clopidogrel 75 mg).
After five days , patient developed acute anterolateral myocardial infarction with ST elevation (STEMI) and was planned for primary percutaneous coronary intervention (PCI) (time from STEMI

Cardio Mag
Volume 1|Issue 6|2020

diagnosis to wire crossing ≈105 min).

Patient had previous history of untreated hyperlipidemia and unrecognized diabetes mellitus (HbA1c = 11. On admission, blood pressure was 100/75 mmHg and heart rate 100 beats per minute. On auscultation, first and second heart sounds were normal, and a third heart sound was audible. The lung examination was unremarkable.

ECG revealed ST segment elevation in anterolateral and precordial leads. The peripheral blood smear revealed PLT of 55.000/µL (visual estimate).

A transthoracic echocardiogram demonstrated anteroapical and lateral wall hypokinesis and severely reduced systolic function (ejection fraction ≈ 35%). The patient was immediately transferred to the catheterization laboratory, where aspirin 80 mg and clopidogrel 300 mg were administered orally prior to coronary angiography.

Coronary angiography revealed a total occlusion of the left anterior descending artery (LAD), high-grade proximal stenosis in the first diagonal branch (90%), diffuse atherosclerosis of the left circumflex coronary artery (LCx), and moderate to severe stenosis (70%) in the middle of a dominant right coronary artery (RCA) . The LAD lesion was considered as culprit, and PCI was performed.

During procedure, bivalirudin was administered intravenously. Multiple dilatations of the LAD lesion with a drug-eluting balloon 3:5 × 15mm were performed . As thrombotic material was present and due to no-reflow phenomenon, eptifibatide (a glycoprotein IIb/IIIa inhibitor) and adenosine were administered intracoronary

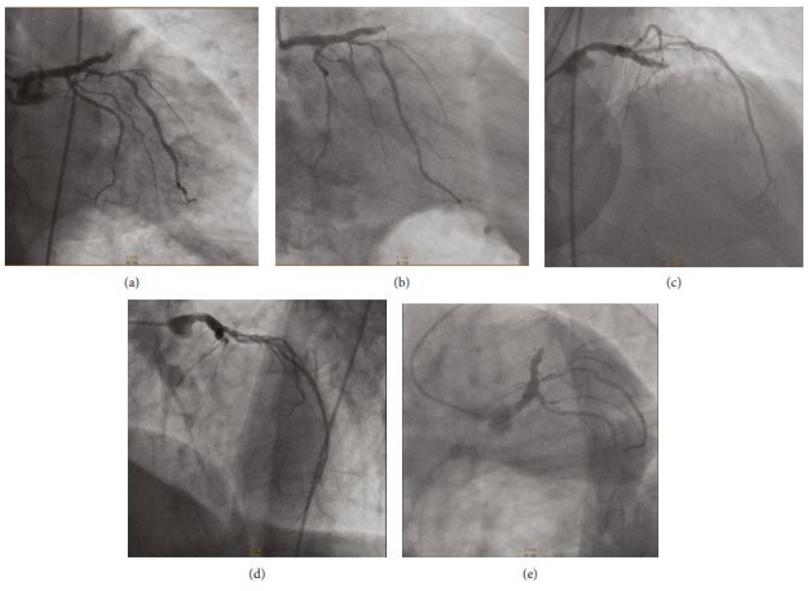


FIGURE A total occlusion of the left anterior descending coronary artery (LAD), high-grade proximal stenosis in the first diagonal branch (90%), and a diffuse atherosclerotic left circumflex coronary artery (LCx) are depicted in RAO caudal (a, b), RAO cranial (c), LAO cranial (d), and LAO caudal (e) projections. RAO = right anterior oblique; LAO = left anterior oblique.

After procedure, the patient was treated with dual antiplatelet therapy (DAPT), aspirin (100 mg/day), and clopidogrel (75 mg/day), but four days later, aspirin was discontinued due to a platelet fall (from 52.000/µL to 16.000/µL). No minor or major bleeding was detected.

Cardio Mag
Volume 1|Issue 6|2020

Bone marrow findings suggested diagnosis of ITP was made. Treatment for ITP treatment was started with intravenous infusion of platelets till level of 115.000/µL was observed, and the patient was discharged from the hospital stable and asymptomatic.
Treatment at discharge included methylprednisolone (40 mg/day), clopidogrel (75 mg/day), bisoprolol (5 mg/day), atorvastatin (40 mg/day), ramipril (2.5mg/day), eplerenone (50 mg/day), furosemide (40 mg/day), ivabradine (5mg/day), metformin (850mg/day), and insulin glargine (40 U/day).

Discussion:

ITP is most commonly seen in females, characterized by a low platelet count due to autoantibody-mediated platelet destruction and suppression of platelet production that predispose to bleeding. ITP may be associated with increased risk of thrombotic events, including acute coronary syndromes (ACS) that may be related to endothelial damage caused by antigenic mimicry between larger and more adhesive platelets and endothelial cells. In addition, it can be related to ITP treatment with steroids that induce metabolic changes and an hypercoagulable state, or intravenous immunoglobulin that may result in expansion of plasma volume and increase in blood viscosity .

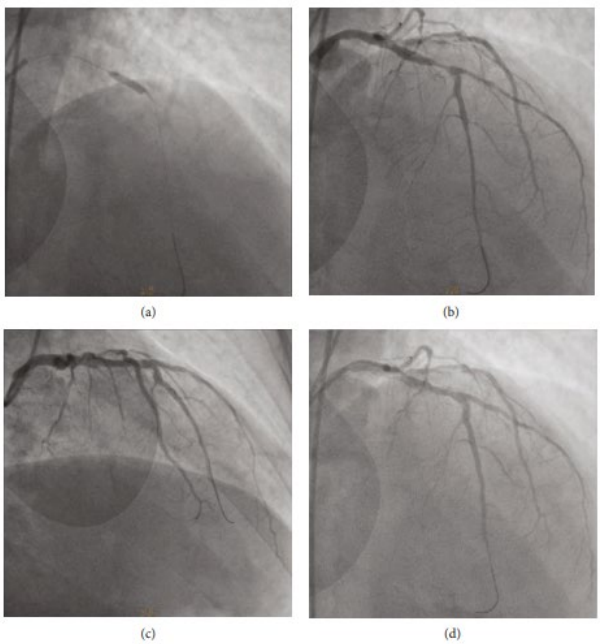


FIGURE Left coronary angiogram in a RAO cranial projection showing (a) dilatation of the LAD culprit lesion with drug-eluting balloon, (b) post predilatation of the lesion using a SC Artimes balloon, and (c, d) successful drug-eluting balloon angioplasty with a TIMI grade II flow. TIMI = thrombolysis in myocardial infarction study group; RAO = right anterior oblique.

Current case was treated with primary PCI using a drug-eluting balloon, as patient's tolerance and response to prolonged DAPT required following stent implantation could not be predicted, given that the patient was recently diagnosed with thrombocytopenia. The stentless approach is also supported by the recent REVascularization

with paclitaxELcoated balloon Angioplasty versus drug-eluting stenting in acute myocardial infarcTION (REVELATION) trial which demonstrated that in the setting of STEMI, the drugcoated balloon strategy was noninferior to drug-eluting stent in terms of fractional flow reserve assessed at 9 months and appeared to be safe and feasible.

Conclusion:

Primary PCI with drug eluting balloon angioplasty is a valid approach in ITP patients with casreful monitoring of platelet count.

Reference:

1) Iakovis N et al. Case Report Recurrent Acute Coronary Syndromes in a Patient with Idiopathic Thrombocytopenic Purpura. Case Reports in Cardiol.2020; 6738348 :1- 5 pages

3. A latest blood filtering device gets FDA approval.

A new device D2000 Adsorption Cartridge, is now indicated for adult patients with COVID-19 undergoing respiratory failure.

Cardio Mag
Volume 1|Issue 6|2020

Device lowers the levels of cytokines and other proteins in blood that promote inflammation, thereby mitigating consequences of the infection like shock, lung failure, other organ failure. This blood purification device is been manufactured in large scale to increase the availability of a treatment option for patients in the ICU to help reduce the severity of the disease.

Reference:
Available at : https://www.medgadget.com/2020/04/blood-filtering-device-wins-fda-emergency-use-authorization-for-covid-19.html. Accessed on 23-04-2020.