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Case Report

Diffuse Unstable Atheromatous Plaques, Clinical Significance and Management

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Abstract

Atherosclerosis related disease is one of the leading causes of death in the United States. It affects multiple arterial systems in the body common being coronary artery disease, peripheral vascular disease, carotid artery disease, renal artery stenosis, vertebral artery disease and mesenteric artery disease etc. depending on the affected part of the body. Of these, complex aortic atheromatous plaques carry significant risk for causing embolisation either occurring spontaneously or iatrogenic with catheterization procedures contributing to about 14% in patients with peripheral embolisation, atrial fibrillation and stroke. Complex aortic plaques contribute to a significant mortality risk as high as 20% in three years and it affects the outcomes of interventional cardiac surgeries by increasing mortality and morbidity. Multiple factors increase the risk of embolisation including plaque location, thickness, ulceration and mobility. Various studies assessed multiple significant risk factors for atherosclerosis including hypertension, hyperlipidemia with high LDL lipoproteins, lack of physical exercise, high fat diet, low antioxidant levels, smoking, metabolic syndrome, family history, male sex, depression, elevated levels of homocysteine and systemic inflammatory markers. In addition to these risk factors, chronic inflammatory conditions like Rheumatoid arthritis, SLE also increase the risk of atherosclerosis. Oftentimes, it becomes clinically significant when a patient starts to experience symptoms due to unstable atheromatous plaques. We report a case with multiple unstable atheromatous plaques with multiple organ involvement simultaneously and discuss the clinical significance and management.

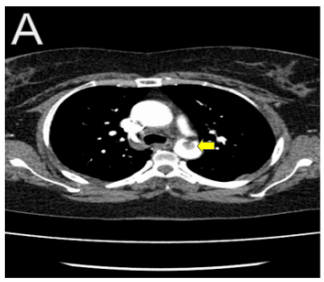
Keywords: *Atherosclerosis; Atheromatous Plaques; SLE*

Introduction

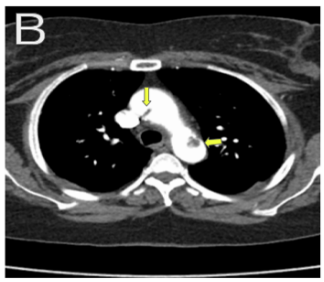
Atherosclerosis related disease is the leading cause of death in the United States. affects multiple arterial systems in the body common being coronary artery disease, peripheral vascular disease, carotid artery disease, renal artery stenosis, vertebral artery disease and mesenteric artery disease etc. depending on the affected part of body. Multiple studies over the past several years showed multiple significant risk factors for atherosclerosis including hypertension, hyperlipidemia with high LDL lipoproteins, lack of physical exercise, high fat diet, low antioxidant levels, smoking, metabolic syndrome, family history, male sex, depression, elevated levels of homocysteine and systemic inflammatory markers. Oftentimes, it becomes clinically significant when a patient starts to experience symptoms due to unstable atheromatous plaques [1,2]. We report a case with multiple unstable atheromatous plaques with multiple organ involvement simultaneously and discuss the clinical significance and management.

Case Report

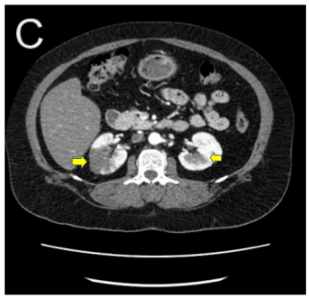
A 52 year old female with a history of uncontrolled hypertension presented to the emergency department with acute onset of bilateral flank pain and confusion of 2 hour duration. Physical exam is notable for somnolence and bilateral costovertebral angle tenderness. Emergent computed tomography (CT) chest and abdomen (Panel B, C) showed multiple unstable atheromatous plaques in aorta with rupture and thrombus formation causing multiple bilateral renal infarcts. Findings were further confirmed by CT angiography and transesophageal echocardiogram showing a mobile thrombus in arch of aorta (Panel A). A follow up MRI brain showed multiple bilateral infarcts suggestive of thromboembolism (Panel D). Cardiology was consulted and they made recommendations to start on antithrombotic therapy. Patient was treated with therapeutic anticoagulation with iv heparin infusion and statin therapy with eventual improvement in symptoms not requiring surgical intervention. Further anticoagulation was changed to oral anticoagulation at discharge and the patient has been followed at 1 month and 3 months intervals without major events.



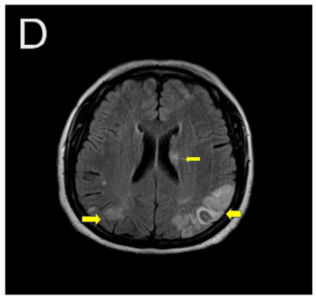
Panel A: A large unstable atheromatous plaque formed a thrombus in aortic arch



Panel B: CT chest with contrast axial view showing multiple unstable atheromatous plaques.



Panel C: CT Abdomen- showed unstable atheromatous plaques in aorta with rupture and thrombus formation causing multiple bilateral renal infarcts



Panel D: MRI Brain showing multiple bilateral infarcts suggestive of thromboembolism

Discussion

In our patient, the risk factors include history of uncontrolled hypertension and family history of coronary artery disease. Patient has no prior history of coronary artery disease or peripheral arterial disease stenting. Atherosclerotic noncoronary disease with unstable plaques carries the same risk as coronary heart disease and should be identified and treated in the early phase to prevent stroke and decrease cardiovascular mortality. Atheromatous plaques can be complex, with high risk features like thickness > 4mm, mobility of a com-

ponent or with features of ulceration. Oftentimes, complex aortic atheromatous plaques are more commonly seen in stroke patients, patients with history of atrial fibrillation and carry high risk of embolisation. This was shown in analysis of SPAF-III trial (Stroke prevention in atrial fibrillation). Plaque rupture is the common cause of thrombosis [1]. Although catheterisation is the gold standard in diagnosis of atherosclerosis, it is expensive and carries significant risk with invasive procedures with increased risk of embolization. Testing biomarkers like coronary artery calcium scoring system, genetic testing and non-invasive imaging includes multiple modalities like Cardiac MRI and CT along with integrating PET (Positron Emission Tomography), combined carotid ultrasound and transcranial Doppler could provide a novel noninvasive method of detecting unstable plaque in asymptomatic patients with high risk for acute coronary syndrome and stroke [2,3]. Initial treatment should include starting on antiplatelet medication and statin therapy. In recent trials, therapeutic anticoagulation is offered in populations with the majority of plaques involving thrombotic components [2].

Conclusion

In conclusion, atherosclerosis is a multisystem involvement disease process causing increased morbidity and mortality. Multidisciplinary management should include lifestyle changes, increasing awareness among patients, offering early genetic testing in patients with strong family history. Offering more non-invasive imaging and testing modalities for detecting atheromatous disease in early phases to initiate appropriate treatment will improve overall patient outcomes and quality of life.

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