



Ο ρόλος της CMR σε συστηματικές παθήσεις με καρδιακές εκδηλώσεις

Sophie Mavrogeni MD FESC
Onassis Cardiac Surgery Center
Athens Greece



INTRODUCTION TO VASCULITIDES

Medium-sized vessel vasculitides:

- Polyarteritis nodosa (PAN) “nodular coronaritis”.
- Kawasaki disease (KD)

Small vessel vasculitides:

- Wegener’s granulomatosis (WG)
- Microscopic polyangiitis (MPA)
- Churg-Strauss syndrome (CSS)

MPA, WG and CSS share several clinical and pathologic features and the association with serum **antineutrophil cytoplasmic antibodies (ANCA)**, which is unusual in PAN

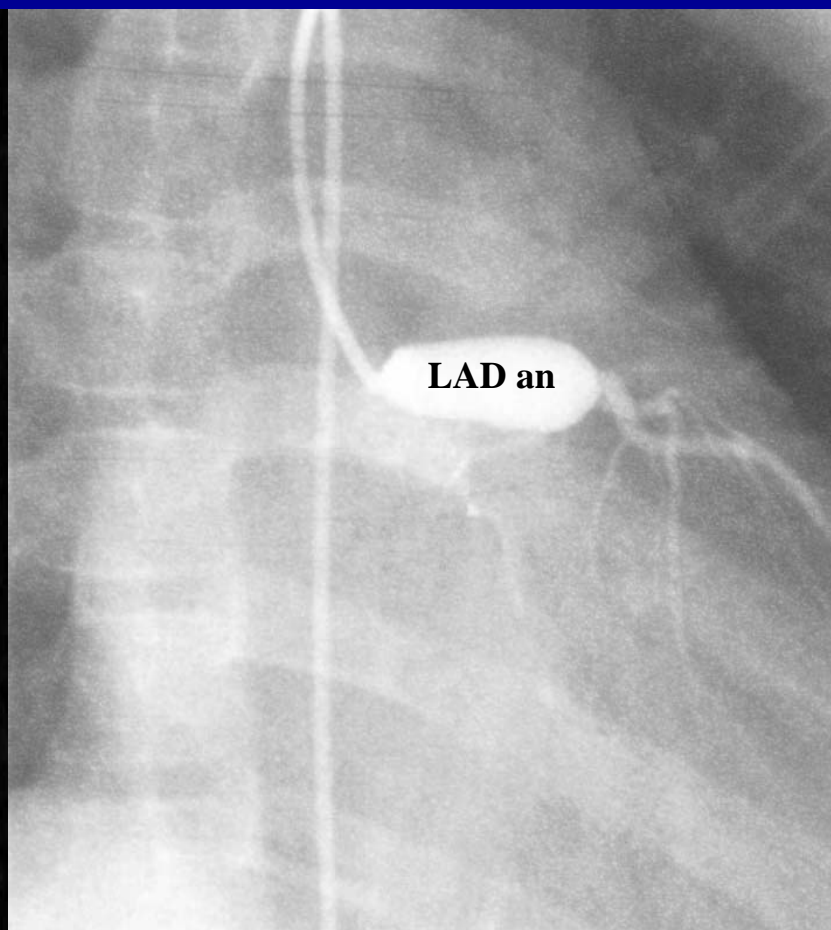
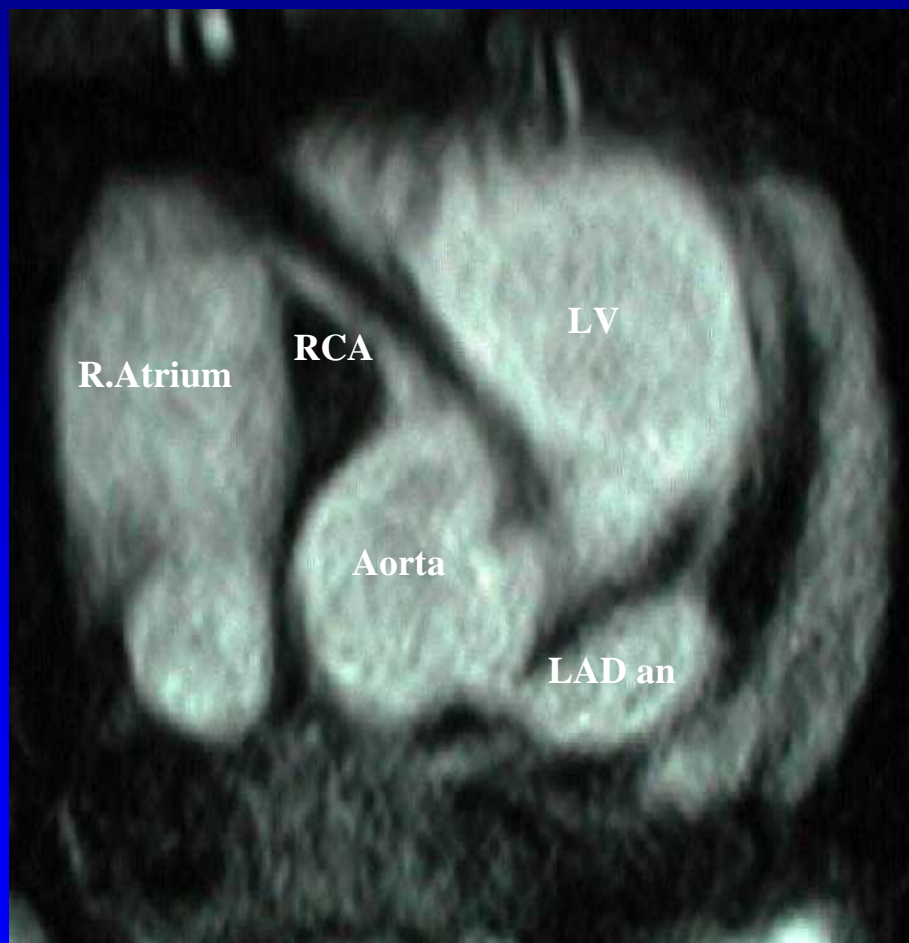


KAWASAKI DISEASE

- Acute vasculitis of unknown etiology in children **<5 years**
- Concurrent **myocarditis / pericarditis** with coronary artery aneurysms in 15-25% of untreated cases
- **Half** of the children with CAA during the acute phase have **normal - appearing vessels** by angiography 1-2 years later
- CAAs may **rupture, thrombose**, or develop **stenotic lesions**.
- **Transthoracic echo** sufficient in children, but deficient in adolescence

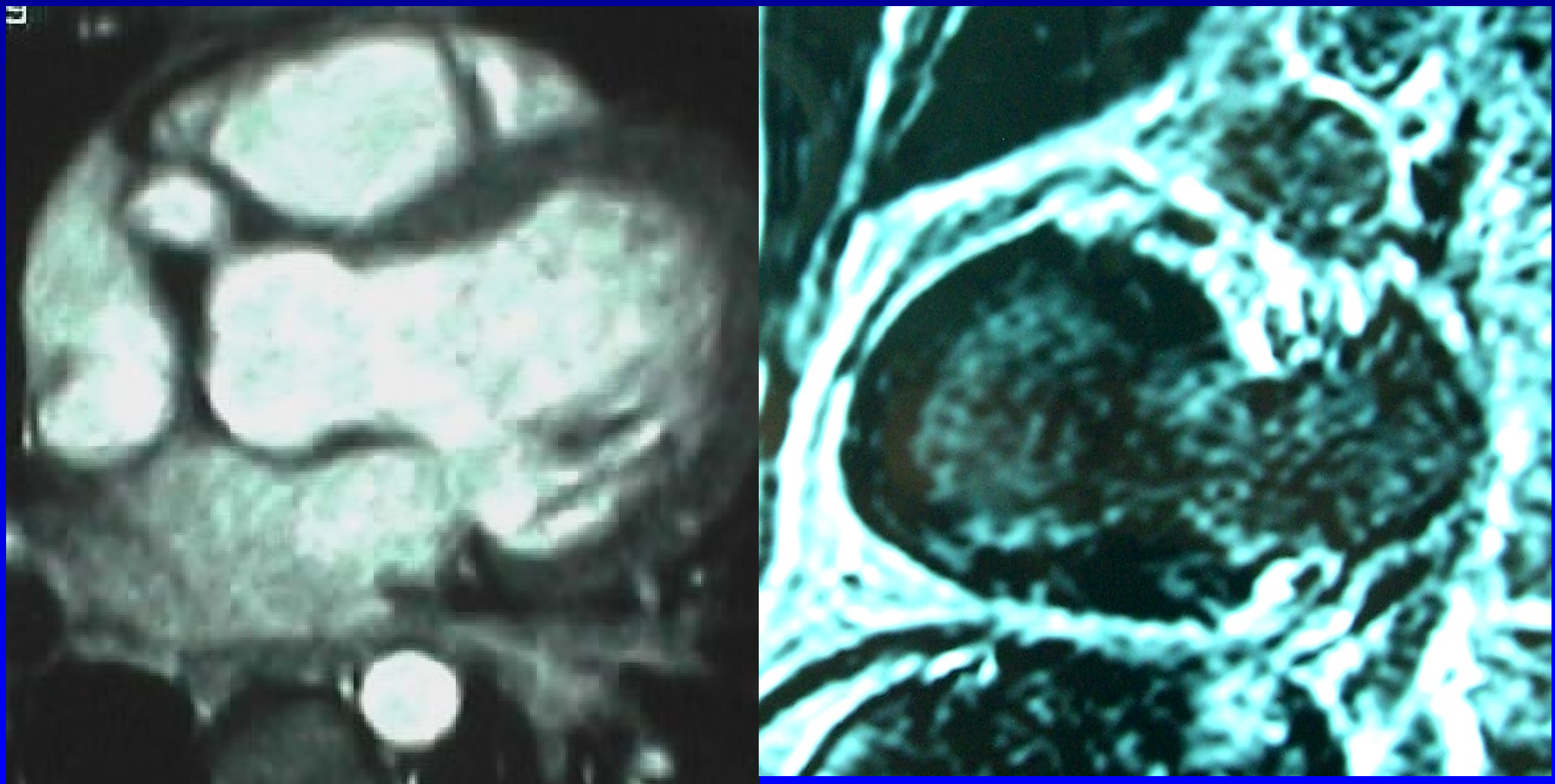


KAWASAKI DISEASE



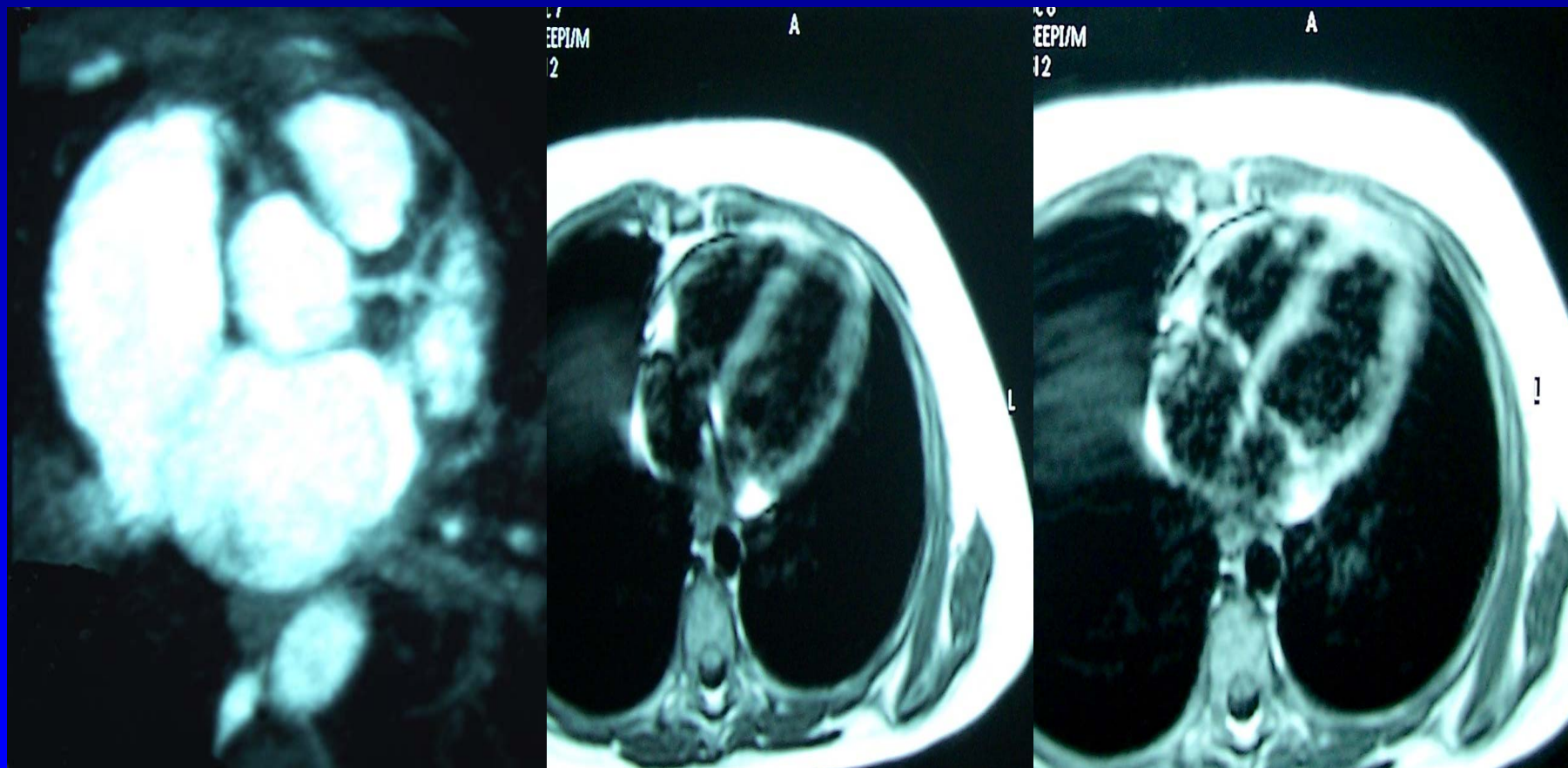
Mavrogeni et al JACC 2004

MAGNETIC RESONANCE ANGIOGRAPHY, FUNCTION AND VIABILITY EVALUATION IN PATIENTS WITH KAWASAKI DISEASE



Mavrogeni et al JCMR 2005

CARDIOVASCULAR MAGNETIC RESONANCE REVEALS MYOCARDIAL INFLAMMATION AND CORONARY ARTERY ECTASIA DURING THE ACUTE PHASE OF KAWASAKI DISEASE



Mavrogeni et al Int J Cardiol 2008



ALGORITHM ABOUT HOW TO IMAGE KAWASAKI DISEASE

- **Echo:** the bedside technique of choice during the acute phase (coronaries and cardiac function).
- **MRI:** especially valuable in adolescents (advantage of simultaneous perfusion, function and viability evaluation).
-
- Combination of **Echo and SPECT** , if MRI is not available.
- **MSCT** is of **limited value for follow-up**, because of radiation and the misleading data due to coronary calcifications.
- **X-Ray coronary angiography** mainly for cases, where an **invasive procedure** should be performed.

Coronary Artery And Viability Evaluation In Anca-Associated Vasculitides Using Magnetic Resonance Imaging



- Polyarteritis nodosa (PAN), Microscopic Polyangiitis (MPA), Wegener's Granulomatosis (WG) and Churg-Strauss syndrome (CSS) are forms of necrotizing vasculitis.
- CMR assessment of patients with systemic vasculitis reveals coronary ectatic disease in the majority of patients with MPA and PAN, as well as in several patients with WG. Myocardial necrosis can be detected in MPA and CSS.



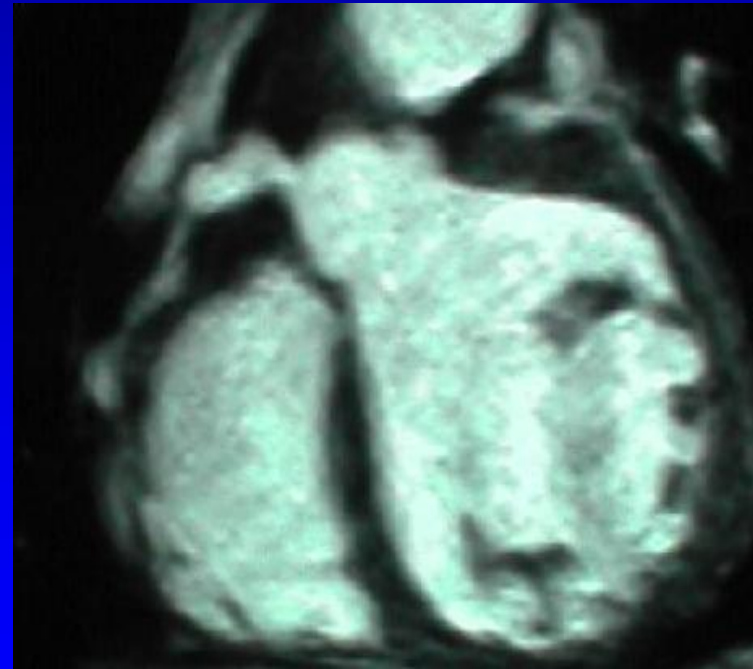
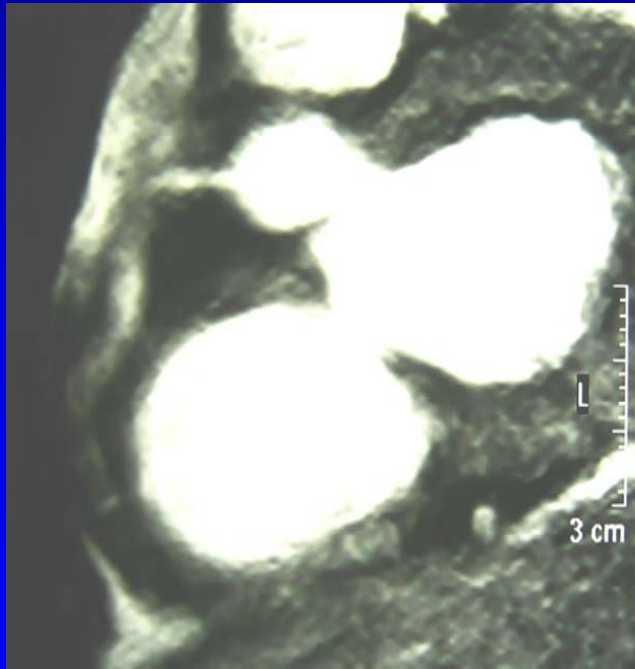
CORONARY ECTASIA AND MYOCARDIAL SCAR IN MPA



Mavrogeni et al *Arthritis Rheumatism* 2009

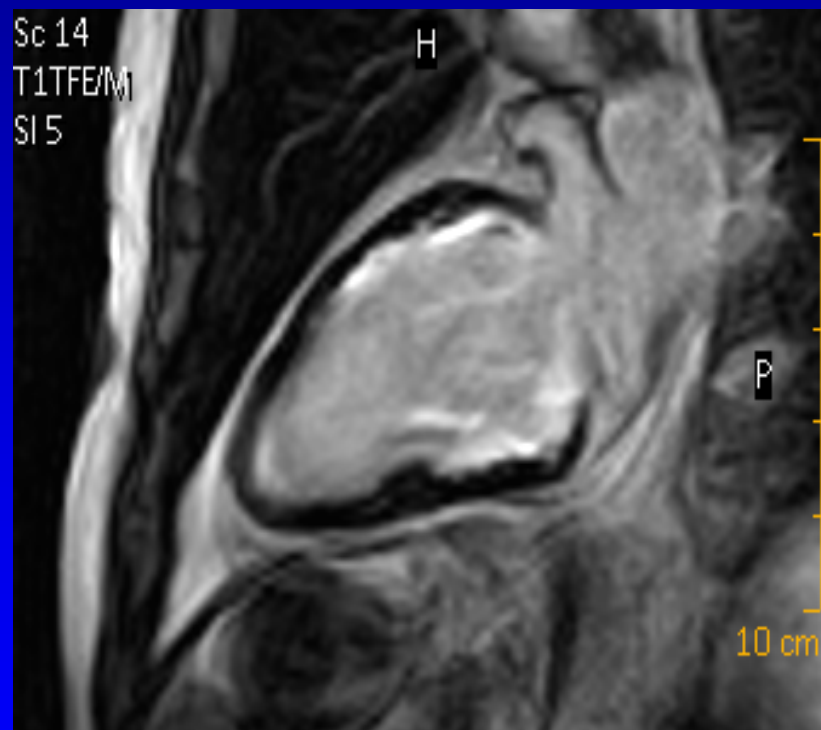


Microscopic polyangiitis and Kawasaki disease without overt clinical cardiovascular manifestations and with abnormal CMR findings





CMR IN CHURG-STRAUSS SYNDROME



Cardiovascular involvement in systemic lupus erythematosus: an autopsy study of 27 patients in India.



- Cardiovascular disease (CVD) is a leading cause of death in patients with systemic lupus erythematosus (SLE) in West.
- **Valvar lesions** the commonest cardiac lesions noted with non-bacterial thrombotic endocarditis in 33%
- **Myocarditis, myocardial scarring** in 37% and 26%
- **Thromboses/embolism** in 33.33%
- **Vasculitis and coronary atherosclerosis** in 18.52% and 3.70%



Myocardial tissue characterization in systemic lupus erythematosus: value of a comprehensive cardiovascular magnetic resonance approach.

- An imaging approach combining T2-weighted, early and late enhancement imaging is a useful tool to assess possible myocardial involvement in SLE.
- CMR parameters of global myocardial involvement correlate well with disease activity, but not with usual clinical signs as summarized in a cardiac score.

Abdel-Aty H, et al. Lupus 2008



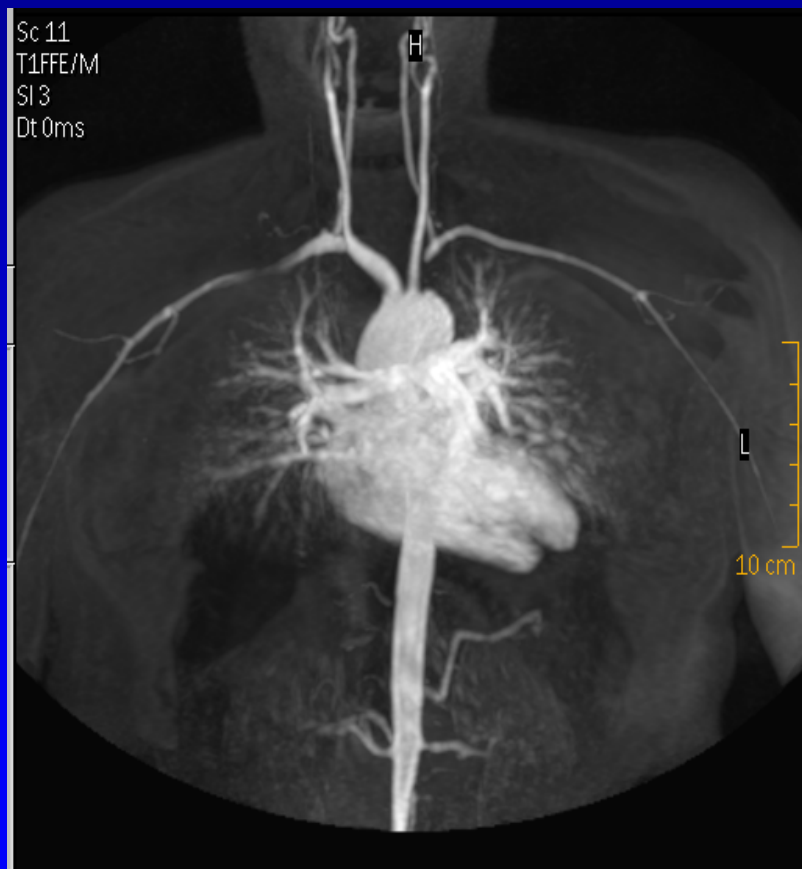
CMR IN SYSTEMIC LUPUS ERYTHEMATOSUS (SLE) AND SJOGREN SYNDROME (SS)



- CMR may reveal myocarditis in SLE patients even in the absence of active disease and/or signs of heart disease, as well as in SS patients with cardiac symptoms.
- The detection of myocardial involvement by CMR in SLE and SS needs to be prospectively validated.



CMR IN TAKAYASU ARTERITIS

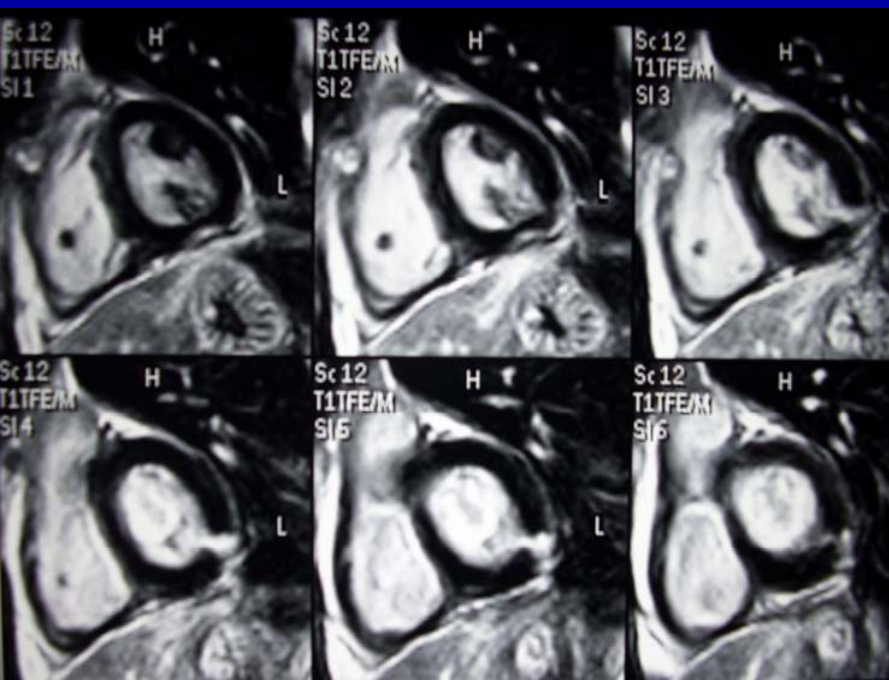


Mavrogeni S et al Int J Cardiol 2009



Frequent Detection Of Myocardial Inflammation In Autoimmune Diseases(AD)

- Autoimmune diseases with myocarditis: SLE, RA, Takayasu's art, SS, thyroid disease.
- Assess by T2-w, early T1-w, LGE images.
- Positive histology and PCR in agreement with 50% and 87.5% of positive CMR.
- Herpes virus, Adeno, Coxsackie B6, Echo, Parvo-B19, CMV, Chlamydia trachomatis or coexistence
- CMR can early diagnose myocardial inflammation





Pattern and distribution of myocardial fibrosis in systemic sclerosis: a delayed enhanced magnetic resonance imaging study

- **DE-MRI can identify myocardial fibrosis in a significant percentage of patients with SSc and may be a useful non-invasive tool for determining cardiac involvement.**

Tzelepis GE, et al. Arthritis Rheum. 2007



MYOSITIS

- Treatment with IV methylprednisolone followed by prednisone and immunosuppressive therapy seems to be effective for treating myocardial involvement in patients with idiopathic inflammatory myopathies.
- CMR is a non-invasive technique that may be a powerful tool for diagnosis and monitoring of myocardial inflammation in this setting.

Allanore et al. Ann Rheum Dis. 2006



10TH Cardiovascular MRI (CMR) Workshop

HELLINIC CMR

Dept. Cardiology, Onassis Cardiac Surgery Center and Cardiovascular MRI WG of the Hellenic Cardiac Society

9th Cardiovascular MRI workshop

ATHENS, 1 OCTOBER 2009

Scientific Programme
endorsed by and accredited by

Cardiovascular
Magnetic Resonance
ESC Working Group

EUROPEAN
SOCIETY OF
CARDIOLOGY

SCMR

EBAC*

Eugenides Foundation
387 Syngrou Avenue, Athens, Greece

18 September 2010

EUGENIDES FOUNDATION

CMR IN DIABETES