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Ομάδα εργασίας Απεικονιστικών Τεχνικών

CONSTRUCTIVE PERICARDITIS

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Constrictive pericarditis
Etiology – Mayo (Rochester) Data (344 patients between 1985-2002)
Cardiac Constriction
Importance of Diagnosis

- Constriction mimics diseases that restrict the myocardium
- Unlike restrictive diseases, constriction can be cured
Constrictive pericarditis
increased pericardial thickness

Constrictive Pericarditis
Pericardial Thickness by Surgical Pathology
143 cases (1993-1999)

117
26

18% of all cases of constriction
Constriction with thick pericardium

Constriction with normal thickness (≤2 mm)

Talreja et al
Constrictive pericarditis pathophysiology

Cardiac volume is fixed
- If flow to one side of heart ↑, flow to other side must ↓
  - Constricting peel causes elevation of diastolic pressure in all chambers
    - Minimal change in diastolic chamber pressure with respiration
  - Pulmonary veins are not Constricted
    - Driving pressure still varies with respiration
Concordance of Intrathoracic and Intrapericardial Pressure - Normal

Dissociation of Intrathoracic and Intrapericardial Pressure in cardiac constriction
2015 ESC Guidelines for the diagnosis and management of pericardial diseases

The Task Force for the Diagnosis and Management of Pericardial Diseases of the European Society of Cardiology (ESC)

Endorsed by: The European Association for Cardio-Thoracic Surgery (EACTS)
Echo  Cardiac CT  CMR
64 year old male patient – BSA 2.2m²
presented with fatigue, decreased exercise tolerance and mild peripheral edema.
Past medical history of recurrent episodes of acute pericarditis over one year
Arterial Hypertension
Physical examination
- Soft S1 S2
- Slightly decreased breath sounds at the bases
- BP 110/70mmHg, HR 75bpm
Lab tests
WBC: 6.200
Hct :43
Hb :13,3mg/dl
Hs CRP  5,2mg/lit
Urea 34mg/dl, Cre 0,7, ALT/AST 23/27I/lit,
Na :141MEq/lit, K: 3,8mEq/lit
NT-pro BNP :89pg/ml
Tb ramipril 5mg x1
Tb Furosemide 40mg x1
CMR study

Courtesy of Dr T. Karamitsos
CMR study

- LVEF 60%
- LVEDV 132ml, LVESV 52ml, SV 80ml, LV mass 132gr
- RVEF 65%
- RVEDV 114ml, RVESV 40ml, SV 74ml
circumferential pericardial thickness 5-7mm

Courtesy of Dr T. Karamitsos
Treatment

- 2-3 month course of empiric anti-inflammatory treatment
  - ibuprofen
  - colchicine

- Pericardiectomy ?
American Society of Echocardiography Clinical Recommendations for Multimodality Cardiovascular Imaging of Patients with Pericardial Disease

Endorsed by the Society for Cardiovascular Magnetic Resonance and Society of Cardiovascular Computed Tomography

European Association of Cardiovascular Imaging (EACVI) position paper: multimodality imaging in pericardial disease
Cardiac Constriction

Respiratory Shift of Ventricular Septum

Use 10 Beat Clips
Cardiac Constriction
Mitral Valve E Velocity Varies with Respiration
Cardiac Constriction
Diastolic Flow in the Hepatic Veins reverses During Expiration
Cardiac Constriction

DTI of Mitral Annulus

- E’ velocity of mitral annulus larger than expected for patient with heart failure - *annulous paradoxus*
- E’ velocity of medial annulus larger than E’ of lateral annulus - *annulous reversus*
Mitral Early Diastolic Flow Velocity (E) Divided by Early Annular Velocity (E’)

For myocardial disease, E/E’ is directly proportional to LV filling pressure.

For constriction, E/E’ is inversely proportional to LV filling pressure.

Ommen SR: Circ 102, 2000
Ha JW: Circ 104, 2001
CMR findings in CP

- Pericardial thickening, pericardial edema, and inflammation using T2 STIR and LGE sequences.
- CMR myocardial tagging sequences: pericardial-myocardial adherence.
- Phase encoding velocimetry: information similar to Doppler echocardiography.
- Real-time cine imaging: demonstration of respirophasic shift of the ventricular septum.
CMR tagging for cardiac constriction
Reduced pericardial LGE after 6 w of prednisone treatment
CT findings

- Pericardial thickness > 4 mm; definition of pericardial calcification
- Direct findings: narrowing and tubular deformation of the right or left ventricle; normal or small ventricular size; straightening of the IVS;
- Dilatation of the IVC, hepatic veins, and right atrium; hepatosplenomegaly, ascites, and pleural effusions
increased pericardial thickness and pericardial calcification by CT in a 40-year-old patient with cardiac constriction

J Am Soc Echocardiogr 2013;26:965-1012
Thick pericardium returning to normal in a patient with transient constriction

Post 1–month steroid therapy

J Am Soc Echocardiogr 2013;26:965-1012
Think constriction

- For patients with dyspnea and/or dominant right heart failure and normal LVEF
- After viral illness
- After cardiac surgery
- Many years after chest Radiation Rx
THANK YOU FOR YOUR ATTENTION