77º CONGRESSO BRASILEIRO DE CARDIOLOGIA
together with
WORLD CONGRESS OF CARDIOLOGY
Rio de Janeiro - Brazil

Colóquio

João Tranchesi (since 1975)

Coordinator

Carlos Alberto Pastore

10/13/22

Collaboration

Nelson Samesima

Mirella Facin

Bruna Madaloso

Caio Tavares

Panelists

Horacio Gomes Pereira Filho

Leandro Ioschpe Zimerman

Luiz Eduardo Montenegro Camanho

Rodrigo do Souto da Silva Sá

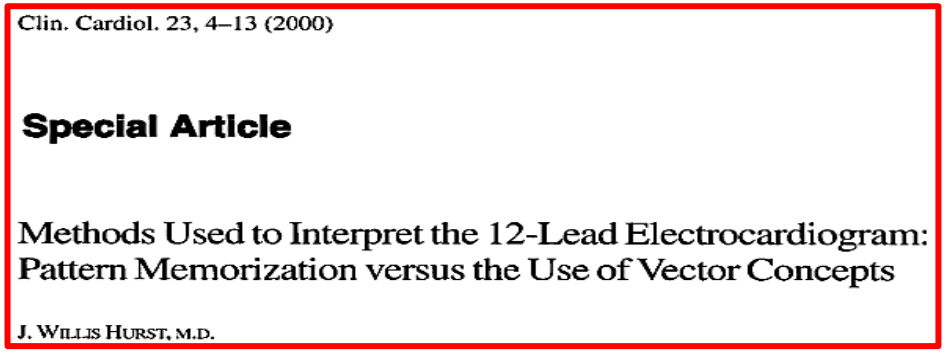
Auditorium 4

9.00 – 10.00 a.m.

Diretriz da Sociedade Brasileira de Cardiologia sobre a Análise e Emissão de Laudos Eletrocardiográficos – 2022

Brazilian Society of Cardiology Guidelines on the Analysis and Issuance of Electrocardiographic Reports – 2022

- Samesima N, God EG, Kruse JCL, Leal MG, França FFAC, Pinho C, et al. Brazilian Society of Cardiology Guidelines on the Analysis and Issuance of Electrocardiographic Reports – 2022. Arq Bras Cardiol. 2022; [online].ahead print, PP.0-0



Clin. Cardiol. 23, 4–13 (2000)

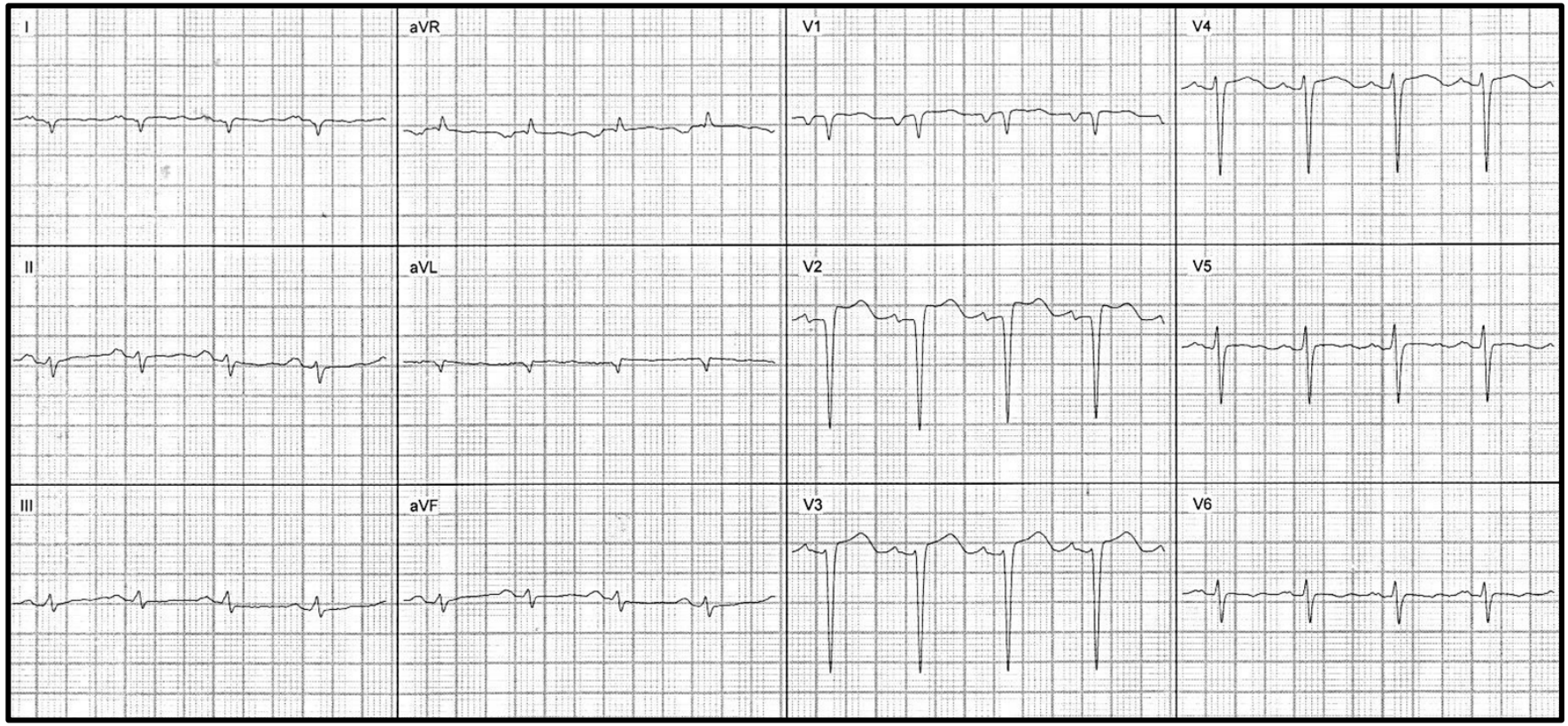
Special Article

Methods Used to Interpret the 12-Lead Electrocardiogram: Pattern Memorization versus the Use of Vector Concepts

J. WILLIS HURST, M.D.

Hurst [19], in a Journal of Clinical Cardiology publication, addressed the mounting evidence indicating that the reading of electrocardiograms (ECGs) had deteriorated significantly[19]. He blames an insufficient understanding of spatial electrocardiography (also known as vectorcardiography) as a key element for the low accuracy of ECG interpretation. Instead of focusing on oriented education that teachs vectorial concepts aiming at understanding the electrical forces that respond for the shape of the ECG complexes – which consumes time and is cognitively challenging – the traditional teaching practices of ECG interpretation use to focus on memorizing the morphological patterns of ECG rhythms!

Case 1: LAG, 52 y.o, male. Dyspneic on progressive effort.



História Clínica

QPD: progressivo cansaço aos esforços.

HPMA: há 3 anos, dispnéia aos esforços que evoluiu para DPN. Há 3 meses, ortopnéia, edema dos MMII e aumento do volume abdominal.

AP: FA paroxística, HAS, DLP, DPOC, catarata bilateral (2015), túnel do carpo bilateral (2012, 2013).

AF: ndn.

MED: atenolol, enalapril, HCT, furosemida, warfarina, sinvastatina, fomoterol/budenosida.

Exame Físico

REG, descorada, hidratada, acianótica, anictérica, afebril, eupneica

CV: BA B_1 hipofonética. Sopro sistólico regurgitativo +/6+ (FT) que aumenta a inspiração B_2 (hiperfonética). Sinais de congestão direita/esquerda.

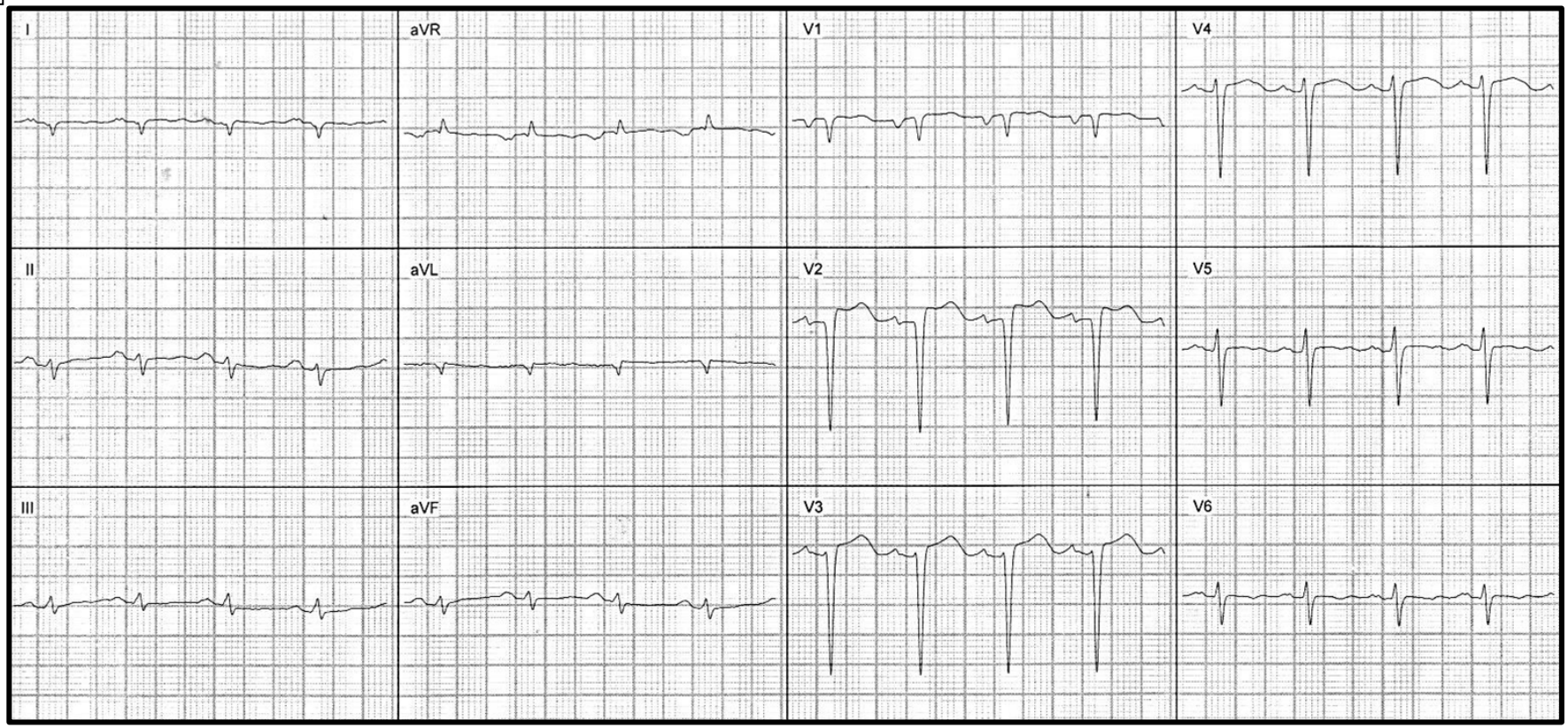
FC=Pulso=70 PA 130 x 80. PVJ elevada – 10cmH20

Pulm: MV+ bilaterais com EC bibasais; SpO_2= 94% (AA)

Abd: globoso, ascítico, fígado a 4 cm do RCD, indolor, RHA+, traube ocupado, baço não palpável

Extremidades: edema 2+/4+

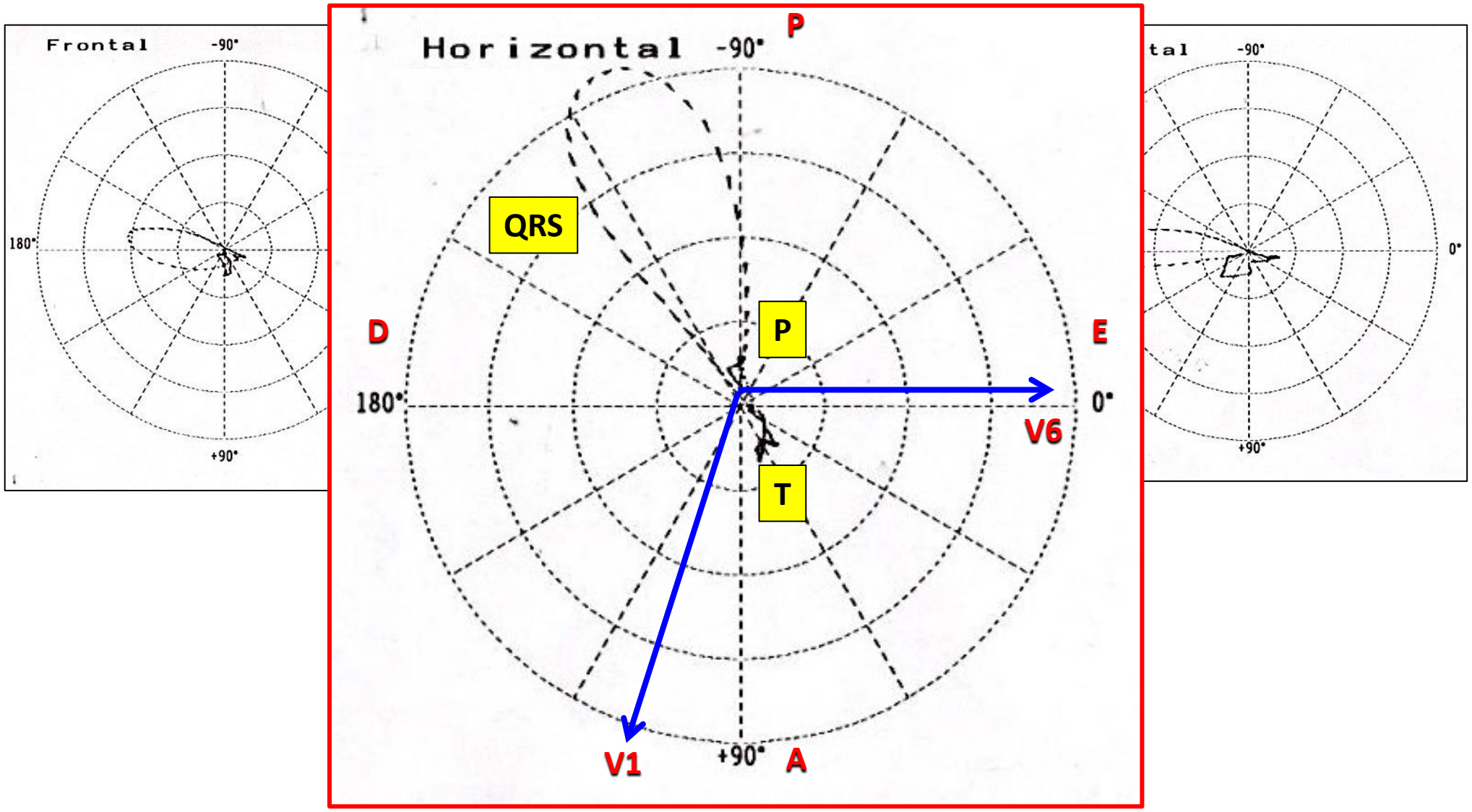
Caso 1



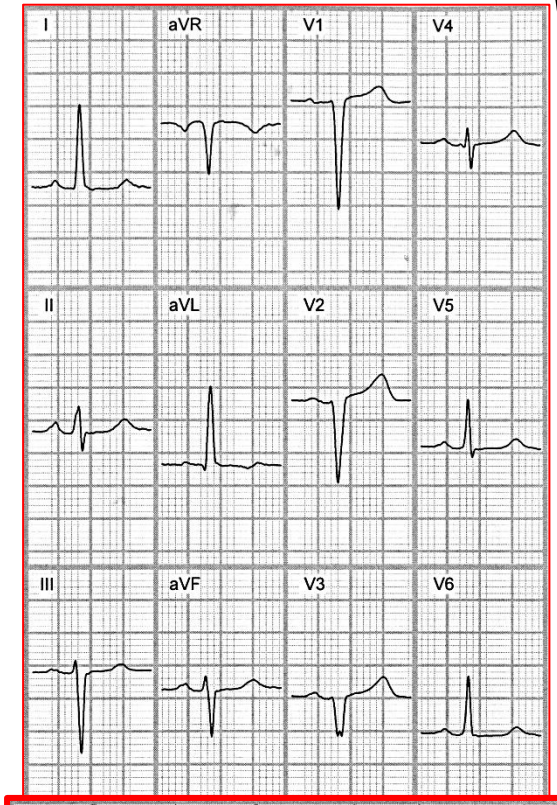
1. LA overload + anteroseptal and lateral inactive area
2. Left chamber overload
3. Early repolarization
4. Current of anteroseptal injury (infarction in progress)
5. Replacement of electrodes

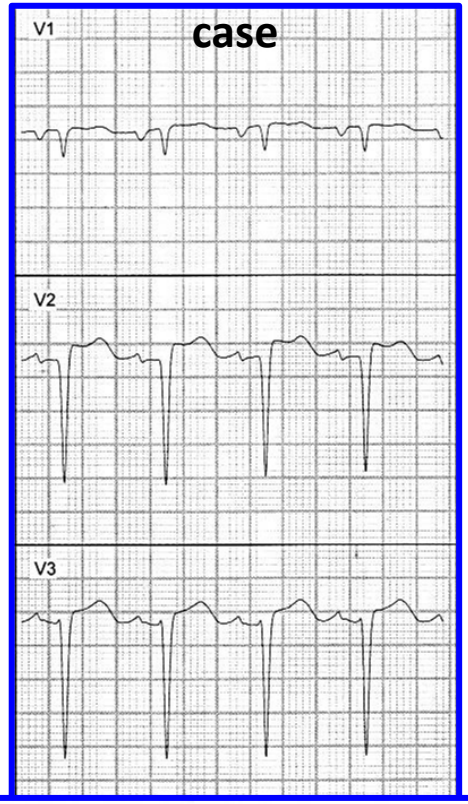
Caso 1

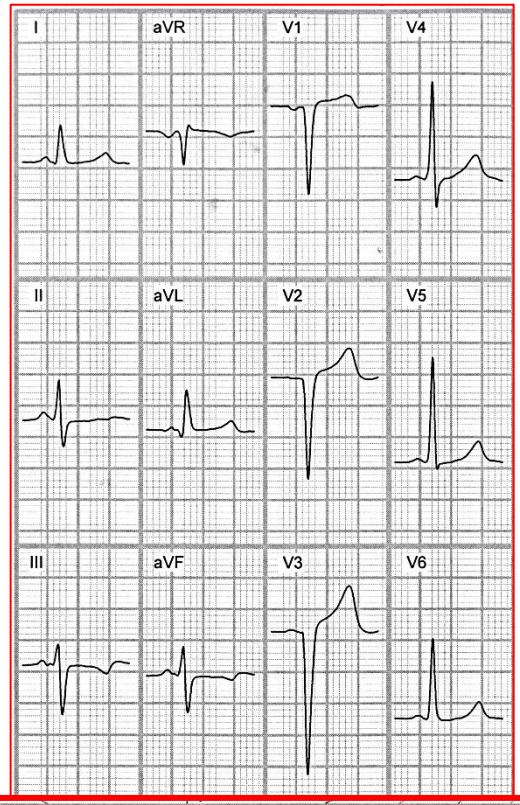
Vectorcardiogram

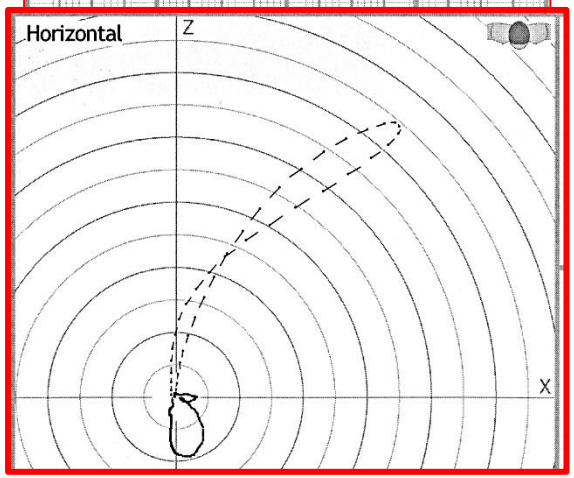


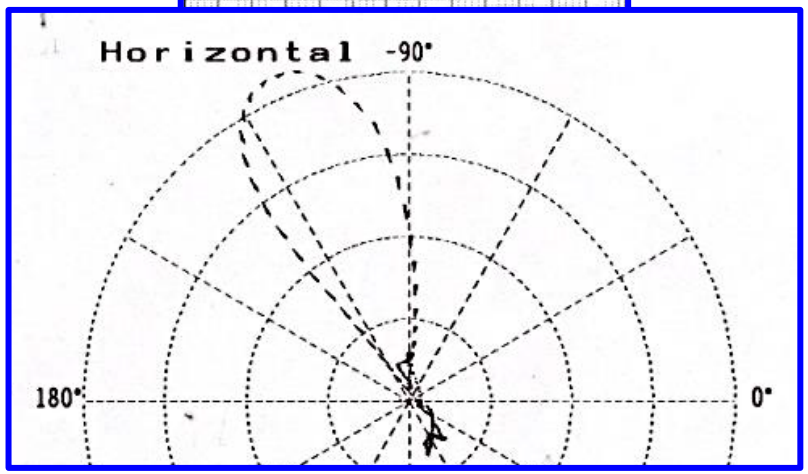
VCG with anterior inactive area (necrosis)

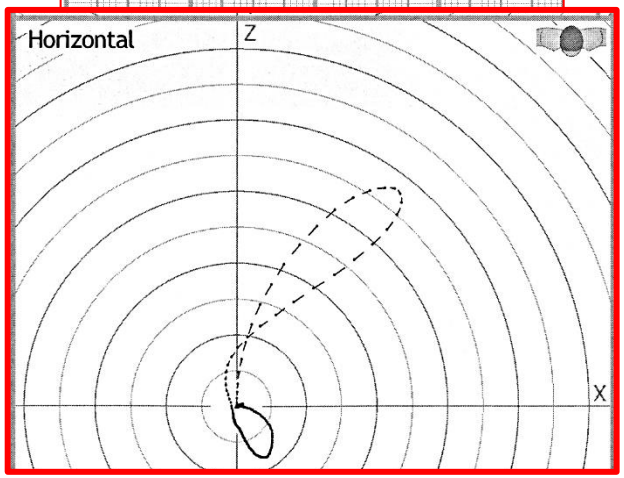










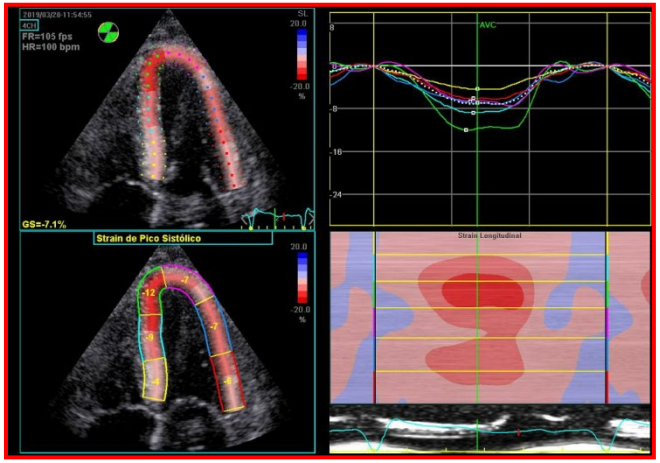


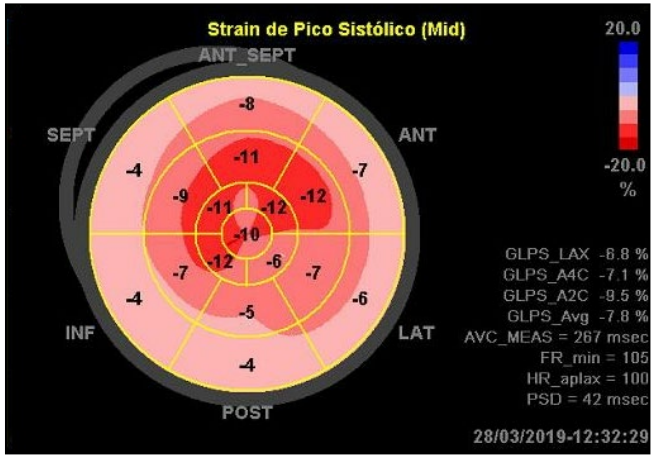
Case 1

Complementary Exams

ECHOCARDIOGRAM

- AO 30 mm LA 46 mm S/PP 17/15 mm
- LF 45 x 31 mm LVEF 50%
- LV asymmetric septal hypertrophy; diffuse hypokinesis
- RA increased
- RV normal
- *Bull´s eye Graphic*:
  - typical pattern of "apical sparing"
  - restrictive filling pattern, no reversal, after Valsalva





Complementary Exams

BIOCHEMICAL

- protein electrophoresis: normal
- immunofixation serum and urinary test: normal
- free light chain test: : normal

CARDIAC MAGNETIC RESONANCE

- diffuse subendocardial enhancement - AMYLOIDOSIS

Restrictive Syndrome

Literature

- **Impairment of ventricular filling with non-dilated ventricles (normal systolic function)**
- **Absence of ventricular hypertrophy and biatrial enlargement**
- **Less frequent than dilated and hypertrophic cardiomyopathies**
- **Leading causes of death**
  - ***African; Indian; Central and South America***
  - **High incidence of endomyocardiofibrosis**
- **Differential diagnosis with constrictive pericarditis**

Restrictive Syndrome

Literature

Myocardial	Endomyocardial
Non Infiltrative	Endomyocardial fibrosis Hypereosinophilic syndrome Carcinoid syndrome Metastasis Radiation Anthracycline cardiotoxicity Drug-induced endomyocardial fibrosis (serotonin, methysergide, ergotamine)
- Idiopatic - Familial - Hypertrophic cardiomyopathy - Scleroderma - Pseudoxanthoma elastic - Diabetic cardiomyopathy	
Infiltrative	
- Amyloidosis - Sarcoidosis - Gaucher´s disease - Hurler syndrome - Fatty infiltration	
Deposition Diseases	
- Hemocromatosis - Fabry disease - Glycogen storage disease	

Cardiac Amyloidosis

Literature – Types

- **Light Chain (AL: primary):** related to plasma cell cloning disorder, 50%, + common >40 years, + symptomatic and with a worse prognosis
- **Hereditary or senile (ATTR):** several gene mutations related to hepatic production of transthyretin, more prevalent between 30-70 years, less symptomatic, low progression and better prognosis
- **Secundary(AA)**

Clinical Manifestation

- **Common:**
  - HF with preserved EF: dyspnea, peripheral edema, hepatomegaly, ascites
- Uncommon:
  - small vessel disease (purpura, angina, claudication)
  - syncope/sudden death (inability to increase cardiac output)
  - progressive conduction system disease (ATTR)
  - thromboembolism (AL)
  - peripheral neuropathy

Selvanayagam et al. *JACC.* 2007.

Amyloidose

Literature – Clinical Suspicion

- Low voltage on ECG and septum-to-posterior wall thickening ≥ 12 mm
- RV or valves free walls thickness
- Intolerance of BB or ACEIs
- Normal or low BP in patients with a history of SAH (systemic arterial hypertension)
- History of bilateral carpal tunnel syndrome and a frequent indication for surgery

AL

- ✓ LVEF preserved in the presence of HF + nephrotic syndrome
- ✓ Macroglossia or periorbital purpura
- ✓ Orthostatic hypotension
- ✓ Monoclonal gammopathy of undetermined significance

ATTR

- ✓ LVEF preserved in the presence of HF in white man age > 60 + carpal tunnel syndrome
- ✓ LVEF preserved in the presence of HF in Afro-Americans with no history of SAH
- ✓ HCM diagnosis in elderly patients
- ✓ Familial history of amyloidosis (ATTRm)

Adaptado Donnely et al. Clev Clinic. 2017.

Amyloidose

Literature – Complementary Exams

Electrocardiogram:

- Low voltage in the frontal plane
- Left axis deviation
- Q waves in leads V1 to V3

Echocardiography:

- ↑ LV wall thickness, with progression to systolic dysfunction (restrictive etiology)
- Diastolic dysfunction E/e' ≥13
- Tissue Doppler: impairment of long-axis contraction (preserved EF)
- ↑ Echogenicity (amyloid deposition): sens. 26-36%; spec. 71-81%

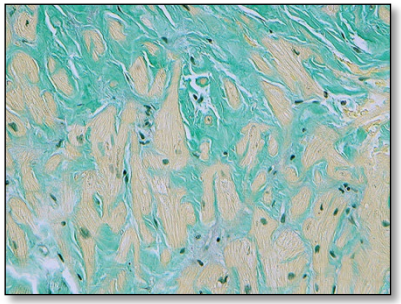
Cardiac Magnetic Resonance:

- High sensitivity for diagnosis
- Distinct patterns for late gadolinium enhancement

Technetium pyrophosphate scintigraphy:

- Sensibility of 91% and specificity of 99%

Biopsy: desuse



Amorphous hyaline deposit in the extracellular space

Selvanayagam et al. *JACC.* 2007.
Donnely et al. Clev Clinic. 2017.

Prevalence of ECG Abnormalities in Patients with Cardiac Amyloidosis

- 127 (ATTR) x 124 (AL)
- Alt ECG: 82% x 72%; p:0,06
  - AF: 4 (1,4-11,2; p:0,008)
  - AVB: 6,2 (2,6-14,9; p<0,001)
  - Low volt.: 0,4 (0,2-0,9; p:0,026)
  - Pseudo-necrosis: ns

Martone R, et al. ESC 2019.

CONCLUSION

Anterolateral Fibrosis - Cardiac Amyloidosis