

# Screening for ATTR Amyloidosis – When, how and Whom?

# Introduction

Rudolph Virchow 1854

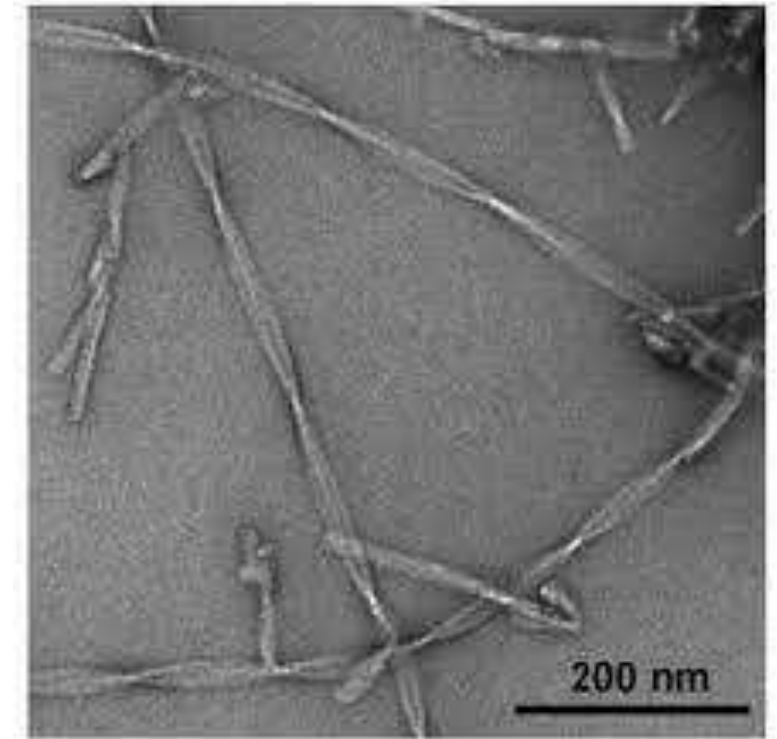
Congored -> hyaline pink 🔍

Apple green birefringence 🍏

AL and TTR.

TTR – Variant & wild type

Secondary AA



# AL amyloidosis

LIGHT CHAIN  $\kappa$

CARDIAC INVOLVEMENT 70 %

MEDIAN AGE OF DIAGNOSIS – 63 M

10 TO 15 % OF M M have AL AMYLOIDOSIS

# TTR AMYLOIDOSIS

Elderly male with HFpEF presentation – wild type

ATTR variant – POLYNEUROPATHY > CARDIOMYOPATHY

WILD TYPE , VAL122ILE & LUE111MET – 100 % CARDIAC INVOLVEMENT

# ***PATHOPHYSIOLOGY***

**AL -> TOXIC INFLITRATIVE CARDIOMYOPATHY**

**2 MECHANISMS – DEPOSITION & TOXICITY.**

**DEPOSITION -> RCM**

**TOXICITY -> APOPTOSIS**

**hATTR -> TETRAMER DISSOCIATION**

**wtATTR – UNSTABLE AS AGE INCREASE**

# CLINICAL FEATURES

AL AMYLOIDOSIS – ORGAN SYSTEM INVOLVEMENT

RENAL – NEPHROTIC RANGE PROTEINURIA

SOFT TISSUE – MACROGLOSSIA , CARPAL TUNNEL SYNDROME

GASTROINTESTINAL – BLEEDING

NEUROLOGICAL – PERIPHERAL or AUTONOMIC NEUROPATHY

PERIORBITAL ECCHYMOSIS – PATHOGNOMIC

ATTR AMYLOIDOSIS

SMALL FIBER LENGTH DEPENDENT PERIPHERAL NEUROPATHY

AUTONOMIC NEUROPATHY

pVal50Met VARIANT – early onset neuropathy

## *WILD TYPE AMYLOIDOSIS*

CARPAL TUNNEL SYNDROME

LIGAMENTUM FLAVIUM THICKENING

SPONTANEOUS TENDON RUPTURE – BICEPS

SOFT TISSUE / ORTHO MANIFESTATIONS BEFORE CARDIAC INVOLVEMENT



# DIAGNOSIS

INDIRECT APPROACH

CLINICAL SUSPICION +  
WORSENING OF  
HYPOTENSION /  
PULMONARY EDEMA  
WHEN BETA BLOCKER IS  
ADDED

INTOLERANT TO ACEi /  
ARBs / ARNIs

REDUCED REQUIREMENT  
FOR ANTIHYPERTENSIVES

AORTIC STENOSIS – LOW  
FLOW LOW GRADIENT  
PHENOTYPE

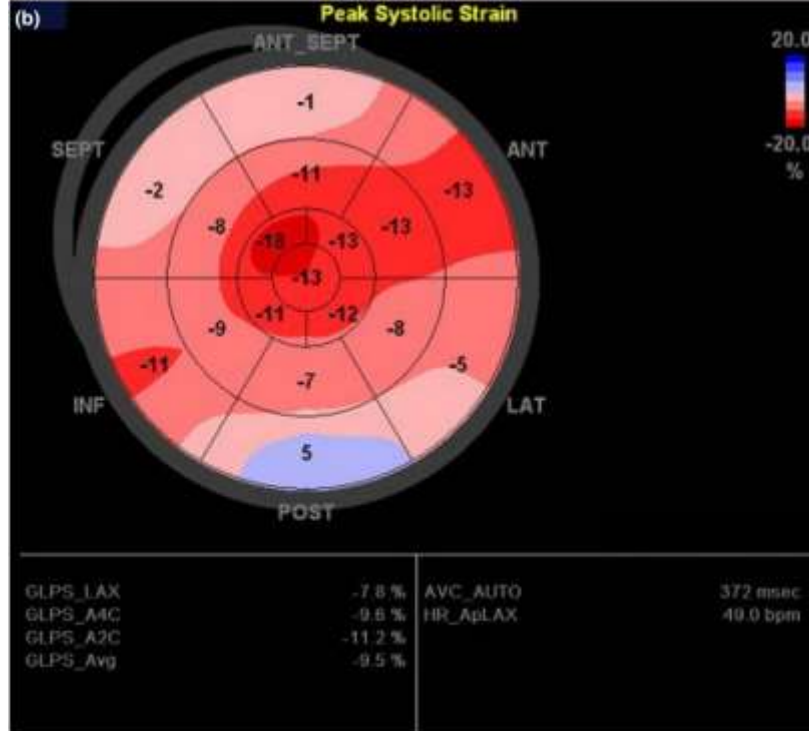
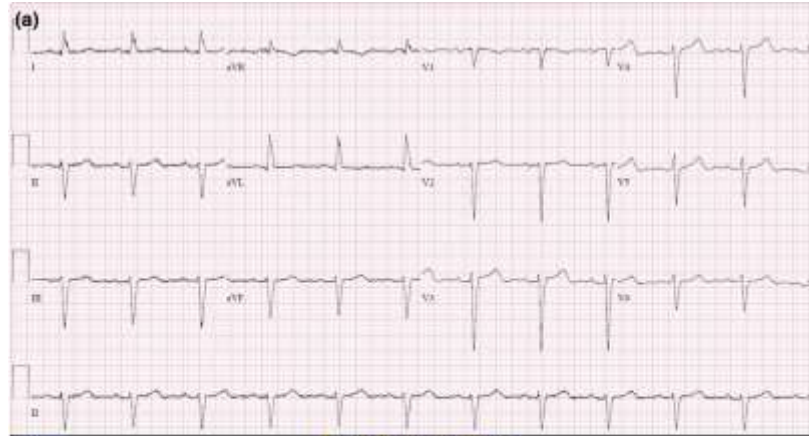
# RED FLAGS

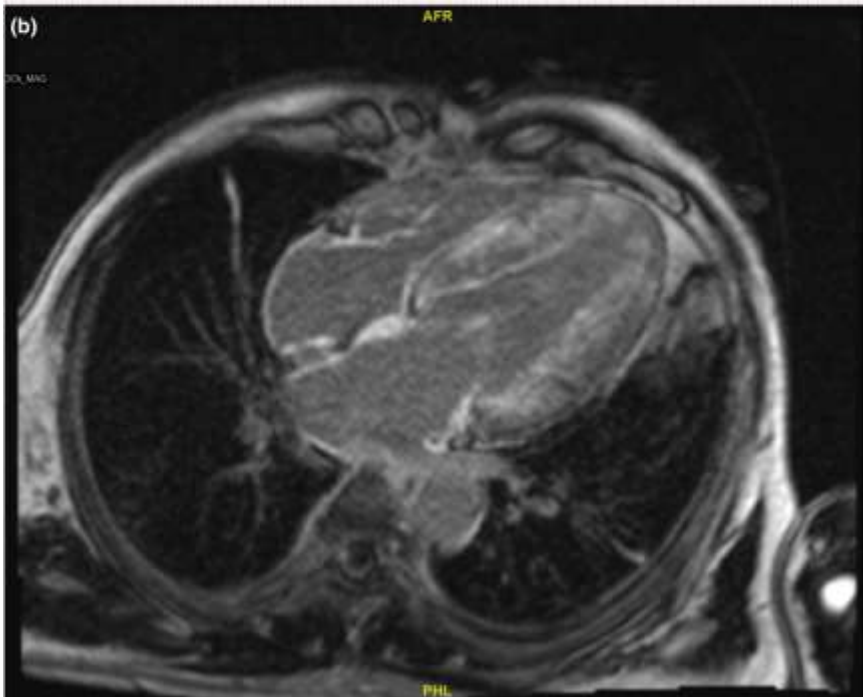
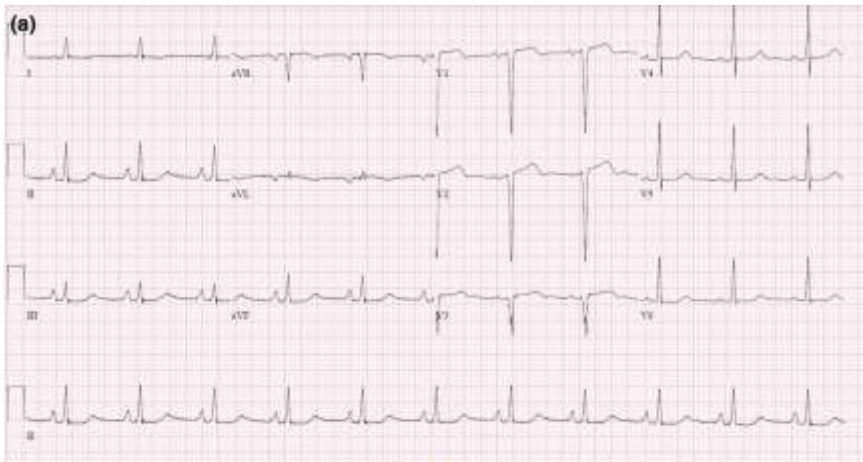
**EXTREME LV WALL THICKENING**

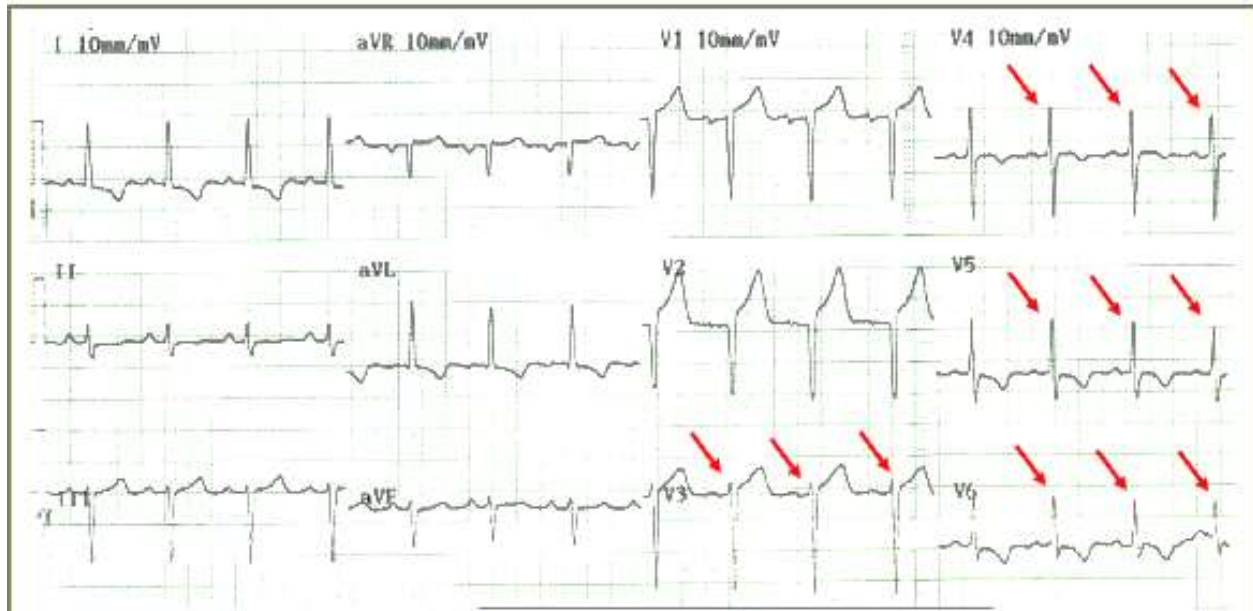
**DISCORDANT ECG VOLTAGES**

**ORTHOPEDIC / SOFT TISSUE MANIFESTATIONS**

***IMAGING TESTS***







**Figure 1.** The electrocardiogram showed low voltage in the limb leads and a small R wave amplitude across the precordial leads (arrows).

# SUSPICION ?

LVH WITHOUT A CAUSE

HFpEF WITH RHF

HFpEF in 60 + MALE WITH NORMAL / LOW PRESSURE

ECG DISCORDANCE FOR WALL THICKNESS

H/O CARPAL TUNNEL / LUMBAR SPINAL STENOSIS / SPONTANEOUS BICEPS TENDON RUPTURE

**PARADOXICAL LOW FLOW LOW GRADIENT AS**

**LGE ON CMR + EXTRACELLULAR VOLUME**

**APICAL PRESERVATION ON LONGITUDINAL STRAIN ECHO**

**NTPROBNP AND TROP T OUT OF PROPORTION TO CLINICAL PRESENTATION**

**TROP T PRESISTENT ELEVATION IN THE ABSENCE OF ACS OR OTHER CAUSES**

# NORMAL

BONE  
SCINTIGRAPHY

SPECT RETENTION  
OF MYOCARDIAL  
UPTAKE

ATTR CARDIAC  
AMYLOIDOSIS

GENE SEQUENCING  
TTR

VARIANT – ATTRv

NORMAL – ATTRwt