Tachy and Brady arrhythmias in Hypertension

Arrhythmias and Hypertension, is it an association or pathological correlation?

Amar Alhamdi, MRCP(UK),FRCP(Ed.),

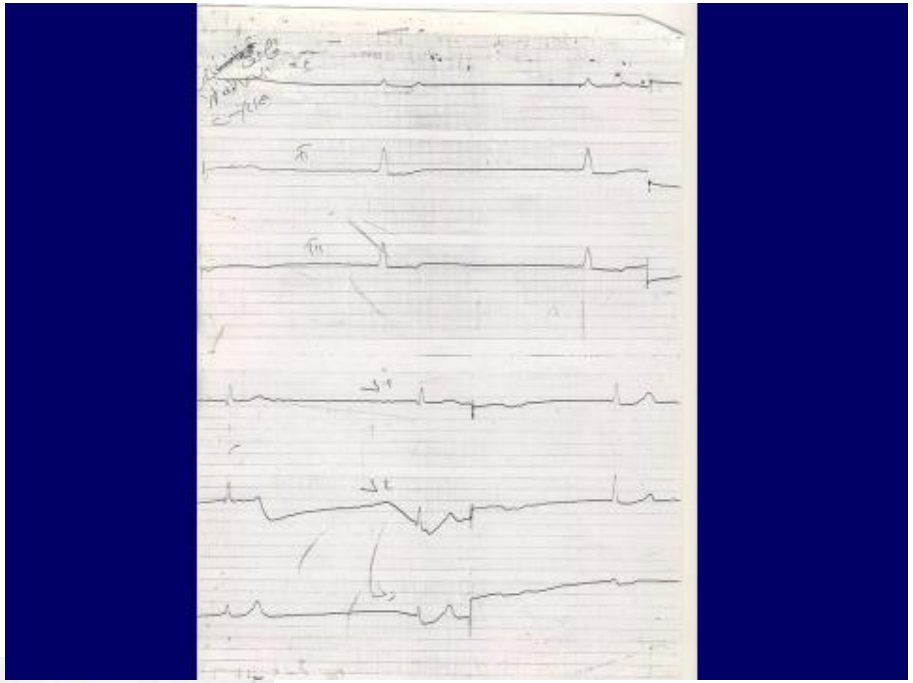
Prof of Medicine, consultant cardiologist and electrophysiologist, Sulaimanya, KRG, Iraq

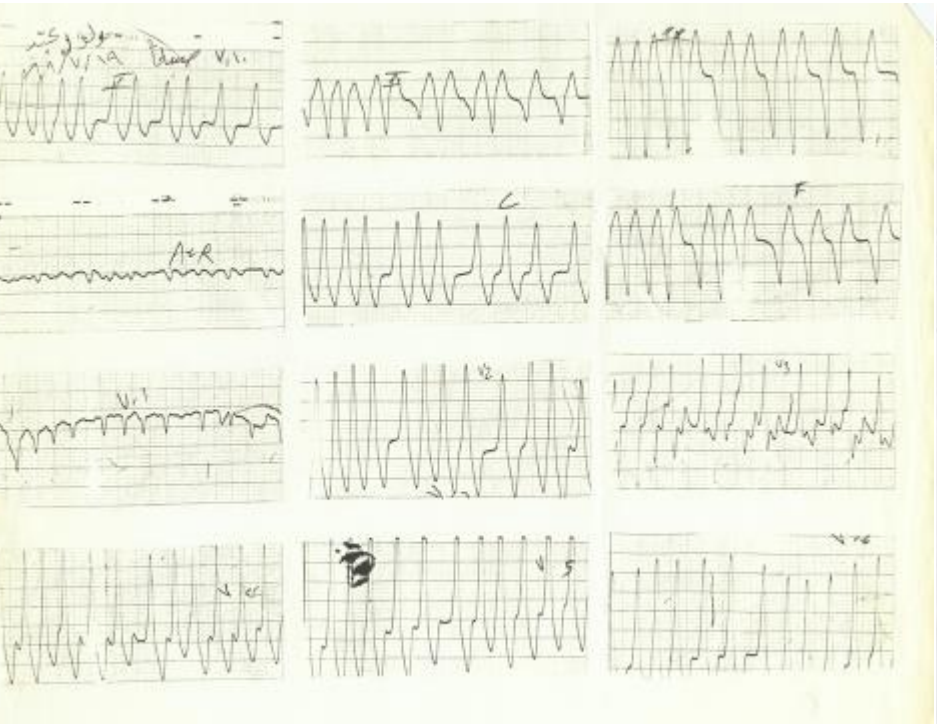
Atrial Fibrillation

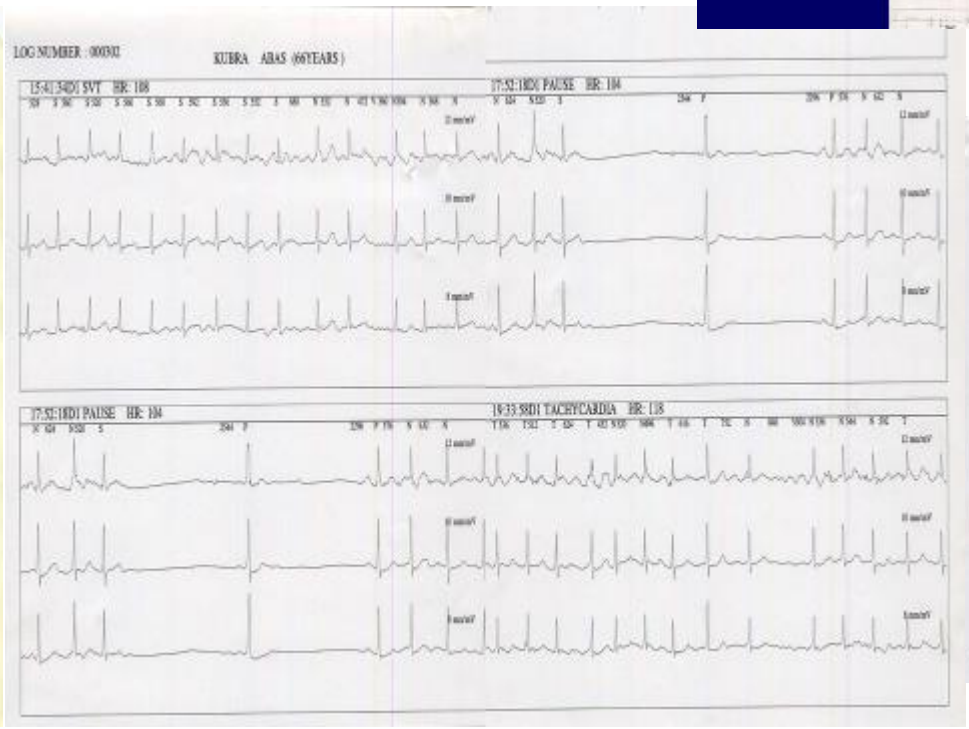
- The commonest tachyarrhythmia is atrial fibrillation

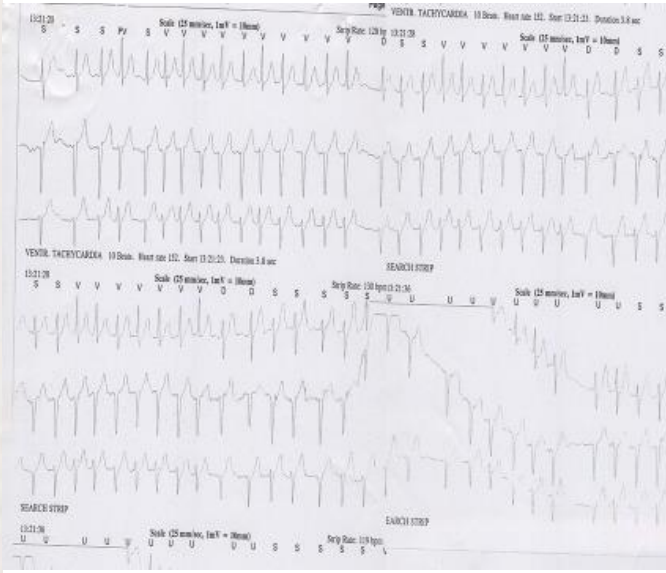
*AF is common in HT patient

**HT is common in AF patient

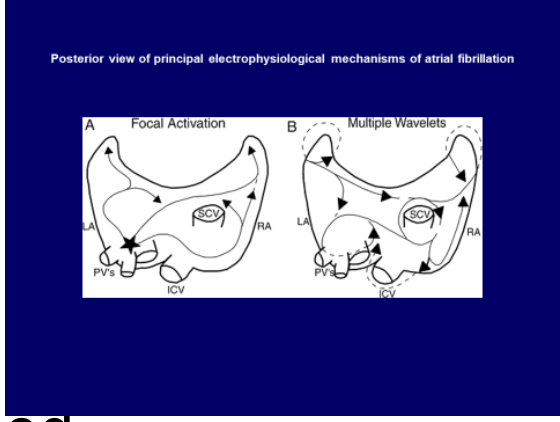








Pathophysiology

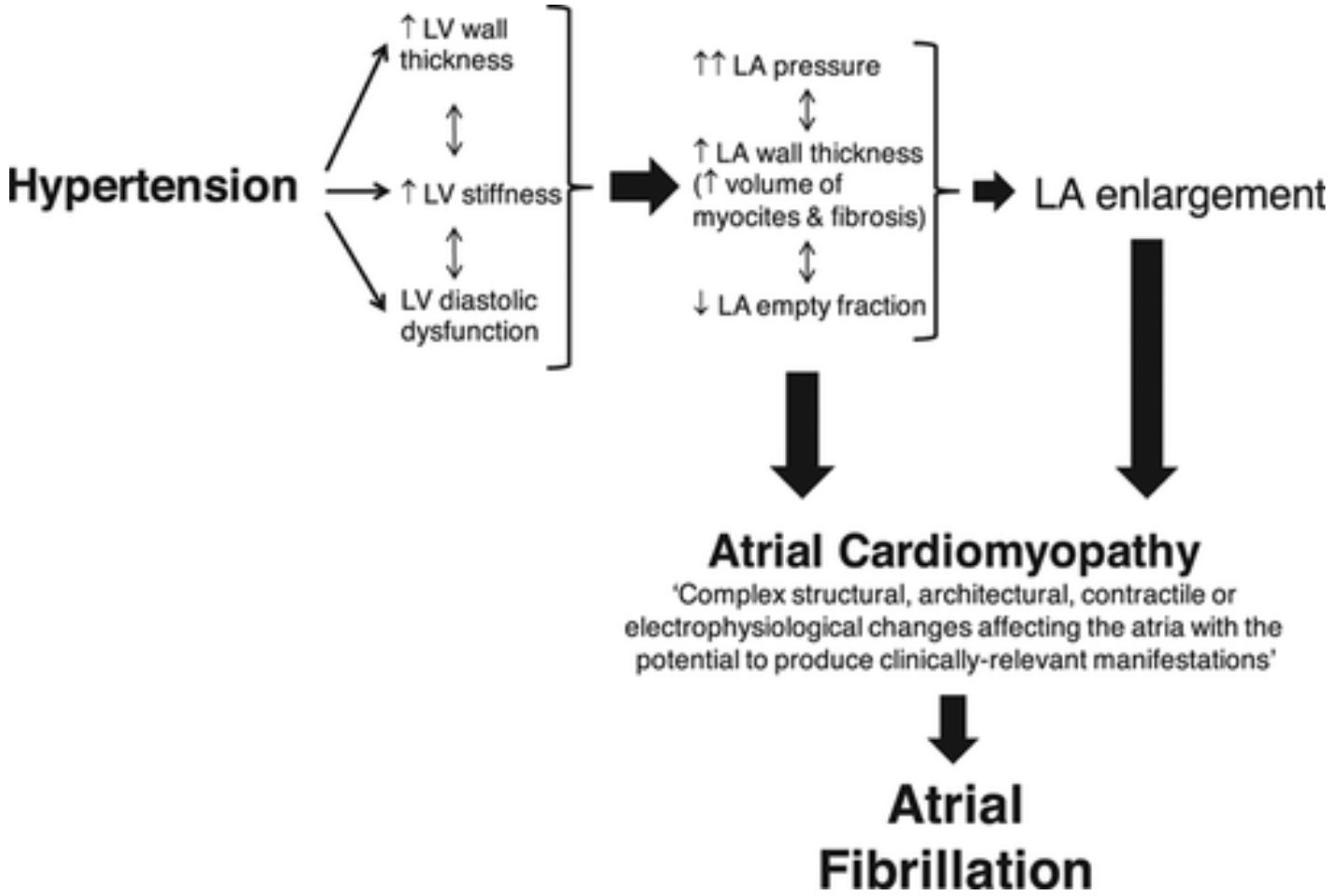


- Development of target organ damage in patients with poorly controlled hypertension puts them at higher risk of development of AF.
- Hypertension not only results in LV hypertrophy but also in atrial stiffening. Increased pressure pulsatility and pulse wave velocity further promote LV hypertrophy, diastolic dysfunction, and increased LV filling pressure, and, ultimately, LA stretch.LA fibrosis .
- Once the hypertension occurred, it predisposes to AF, even if BP control improves later.
- There is growing evidence that even high normal BP (i.e., prehypertension) confers an increased risk of incident AF.

P Verdecchia Circulation Research. 2018 https://www.ahajournals.org/doi/10.1161/circresaha.117.311402#

Clinical data's

- Many data's on the close relationship between hypertension and incident AF led to incorporation of hypertension as a risk factor for AF.
- Hypertension is also a risk factor for AF recurrence, and where rhythm control is the chosen strategy for paroxysmal or persistent AF, effective hypertension management prolongs the AF-free period.


Hypertension
↑ LV wall thickness
↑ LV stiffness
LV diastolic dysfunction
↑↑ LA pressure
↑ LA wall thickness (↑ volume of myocites & fibrosis)
↓ LA empty fraction
LA enlargement
Atrial Cardiomyopathy
'Complex structural, architectural, contractile or electrophysiological changes affecting the atria with the potential to produce clinically-relevant manifestations'
Atrial Fibrillation

Summary AF/HT

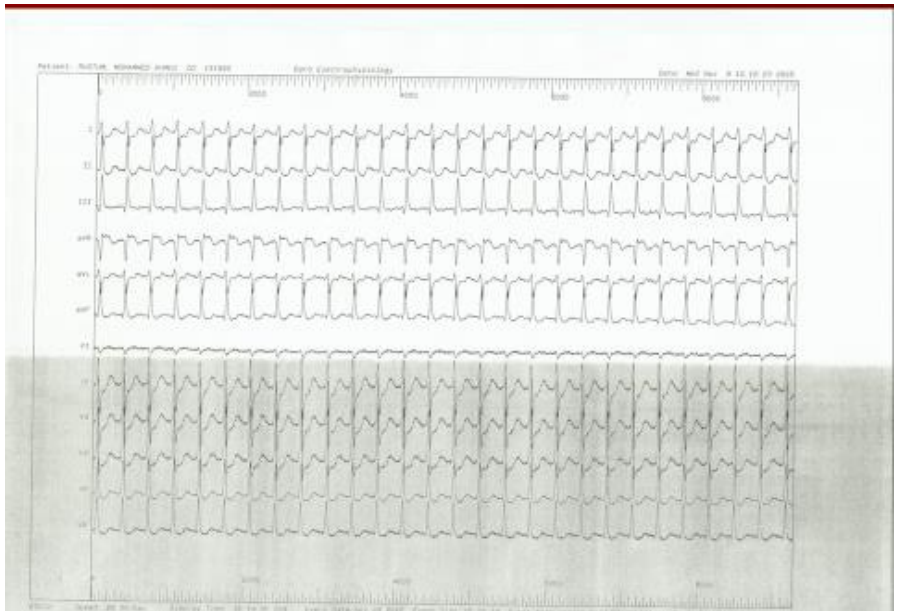
- Epidemiological evidence links hypertension with incident AF.
- Hypertension is a modifiable risk factor and, therefore, carries a potential for AF prevention, lowering AF recurrence rates when rhythm control strategy is applied.
- Nonetheless, many questions still need to be answered, like as optimal thresholds for BP, effectiveness of the renal denervation in patients who receive ablation for AF, impact of BP lowering on diastolic dysfunction, heart failure with preserved ejection fraction in people with AF.
- Nonetheless, it is uncertain whether recent evidence will lead to changes in BP targets for AF patients, and if this will affect the course of the arrhythmia ?
- Several pathogenic mechanisms underlying the higher risk of AF in hypertensive patients are still incompletely known.
- Although several trials reported the overall clinical benefit of renin-angiotensin-aldosterone (RAAS) inhibitors in reducing incident AF in HTN, the role of this class of drugs is greatly reduced when AF diagnosis is already established, thus hinting at the urgent need for primary prevention measures to reduce AF occurrence in these patients.

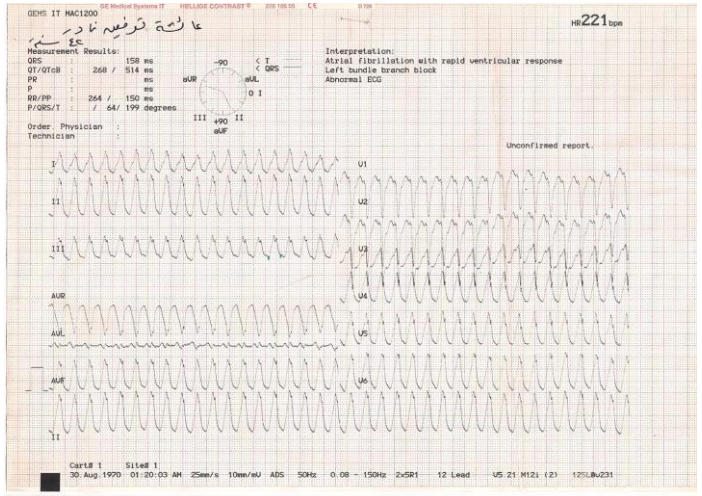
2022 Apr 6;9(4):110. doi: 10.3390/jcdd9040110

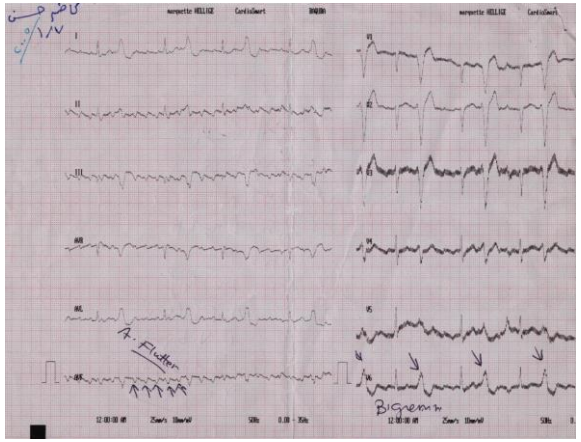
- In conclusion, although RAAS inhibitors do not seem to prevent AF recurrence in patients with an already established diagnosis of this cardiac arrhythmia, ACEi and ARB should be first offered to patients with essential hypertension to prevent incident AF.
- Although BB and MRA should be generally used in addition to ACEi and ARB in specific settings, MRA are to be first considered in specific subsets, such as patients suffering from primary aldosteronism (PA), a non-negligible cause of secondary hypertension.

G Lip **CHA_2DS_2-VASc**

- Hypertensive heart disease can manifest as many cardiac arrhythmias, most commonly being atrial fibrillation (AF). Both supraventricular and ventricular arrhythmias may occur in hypertensive patients, especially in those with left ventricular hypertrophy (LVH) or HF.



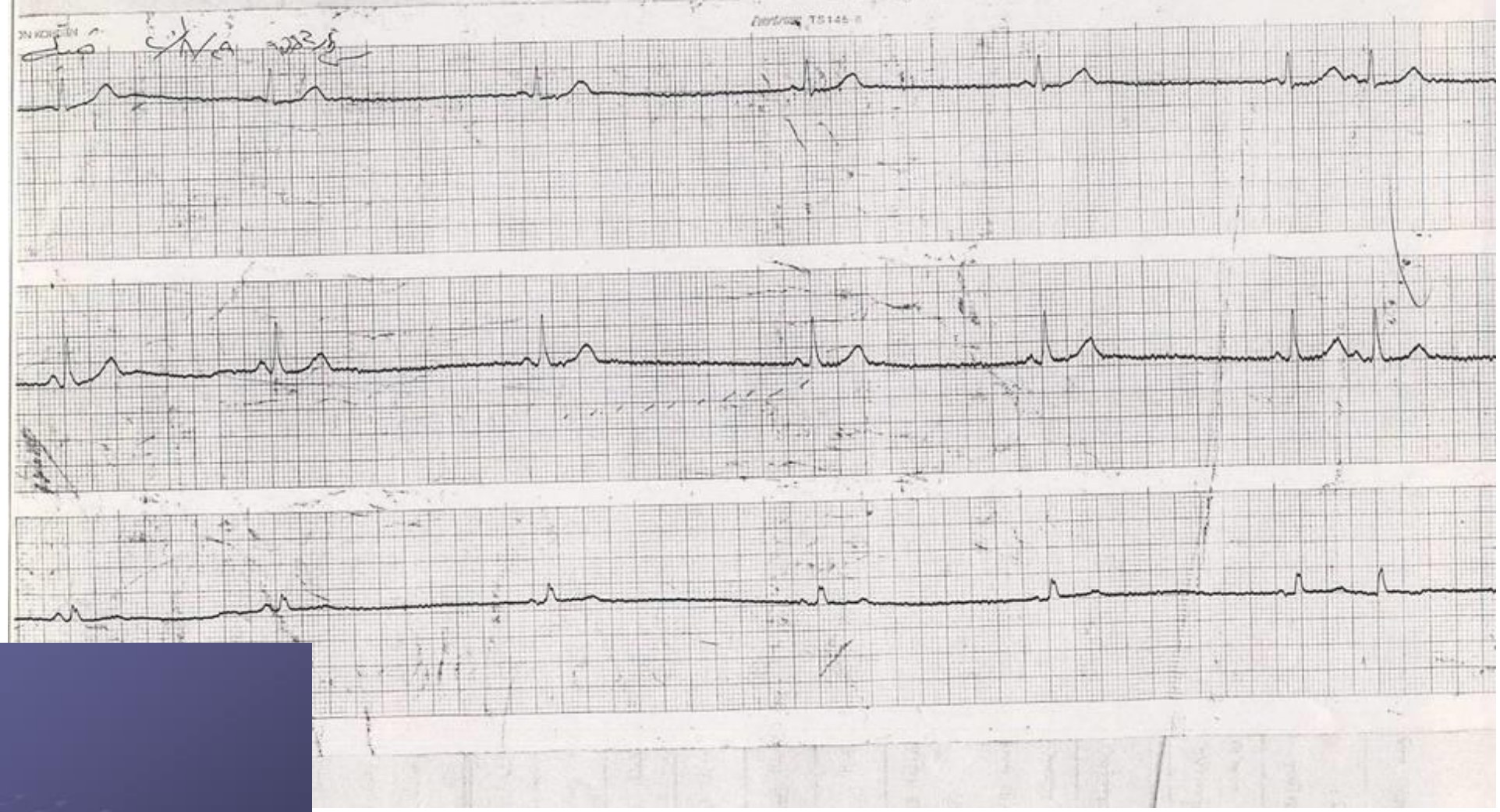




Bradycardia and hypertension

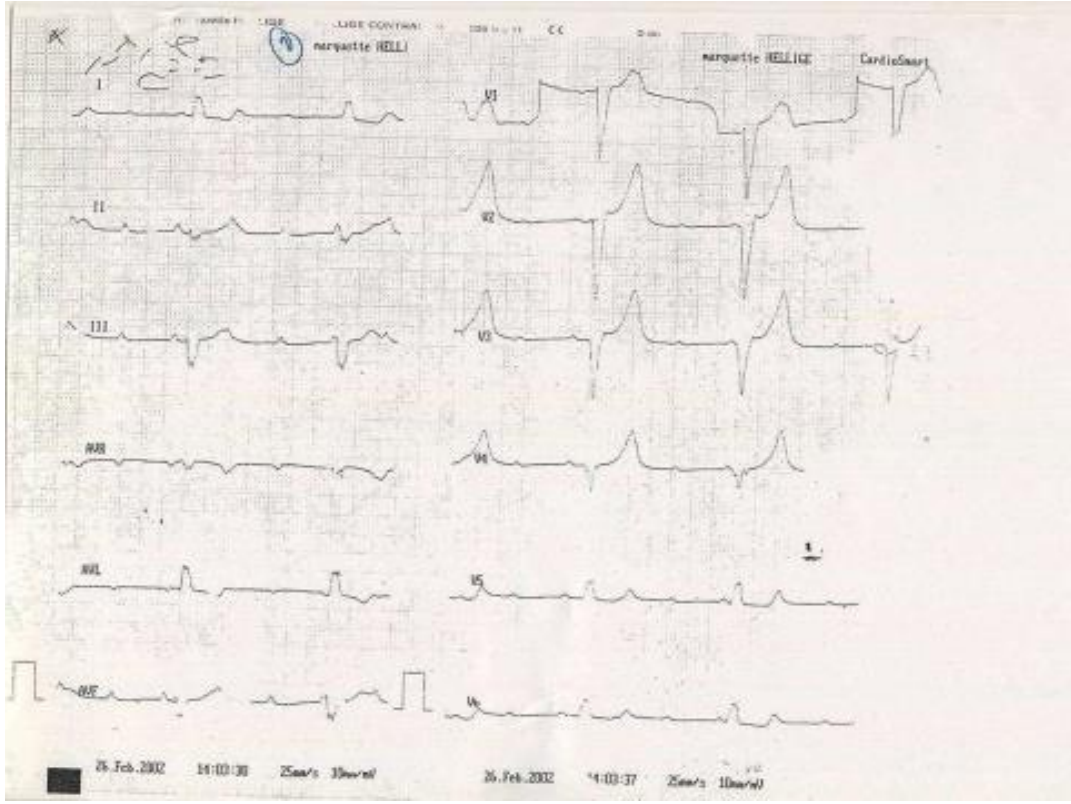
Hypertension secondary to bradycardia

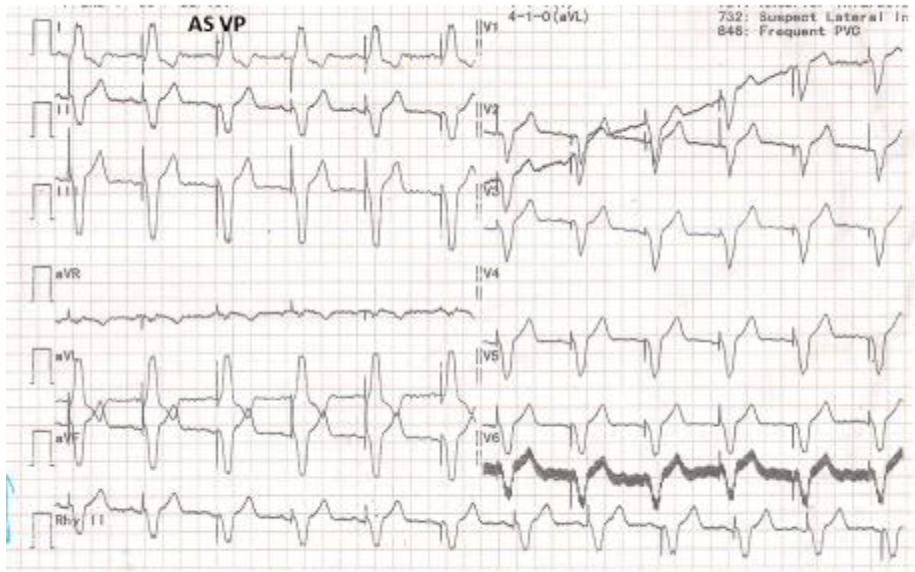
BP 190/70



BP 145/75

BP 185/70





BP 140/70

*The cessation of bradycardia after pacemaker implantation was followed by a significant fall or permanent normalization of the high blood pressure.

****Permanent cardiac pacing as a possible adjunct for the treatment of hypertensive heart disease with bradycardia.**

BB therapy in HT

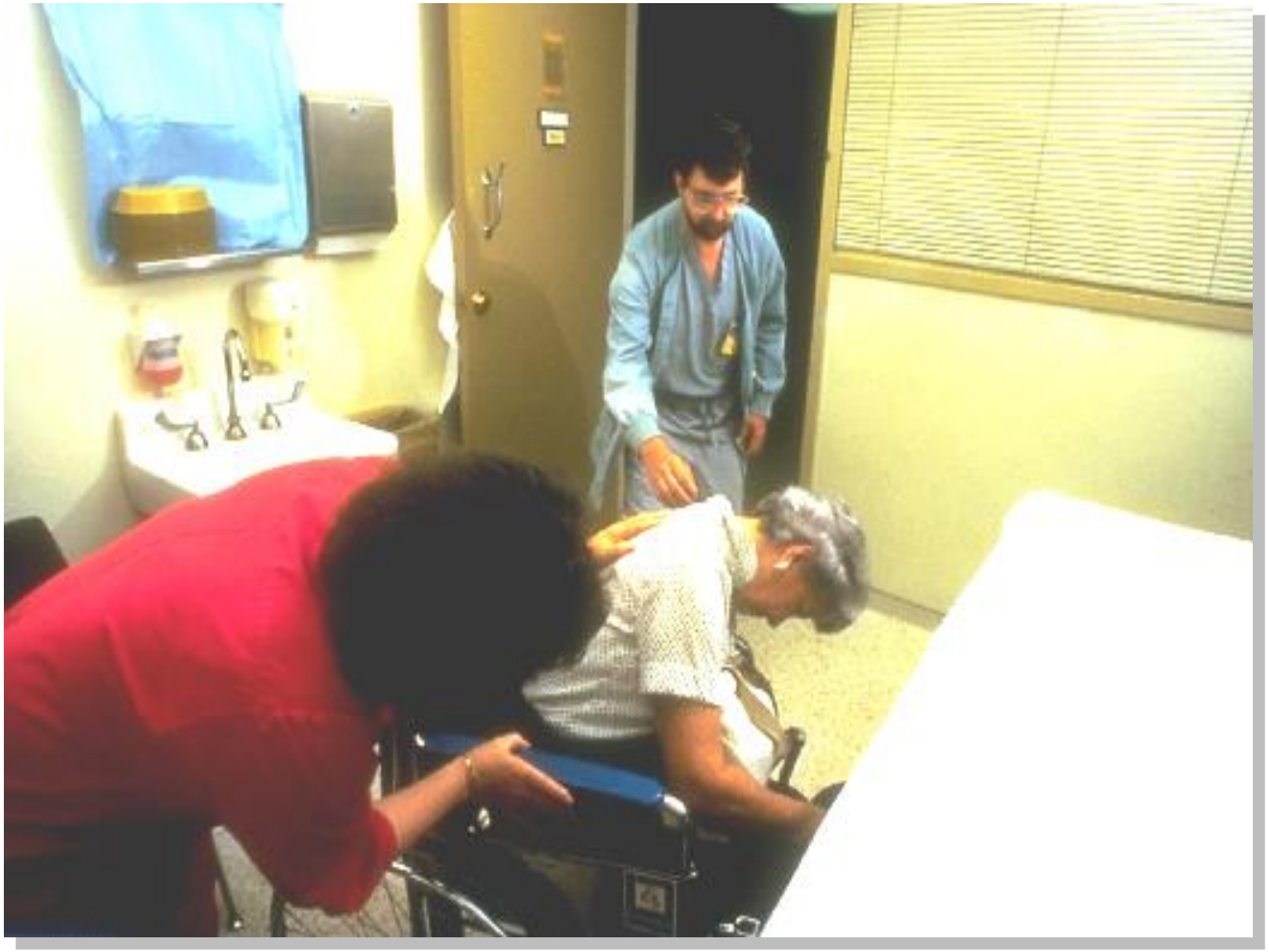
- SB due to BB therapy for HT should be carefully assessed
- Permanent pacemaker may be considered if BB therapy is necessary for BP control. Class II.

*Permanent pacemaker implantation may be considered for AV block in the setting of drug use and/or drug toxicity when the block is expected to recur even after the drug is withdrawn. (Level of Evidence: B. Class IIb

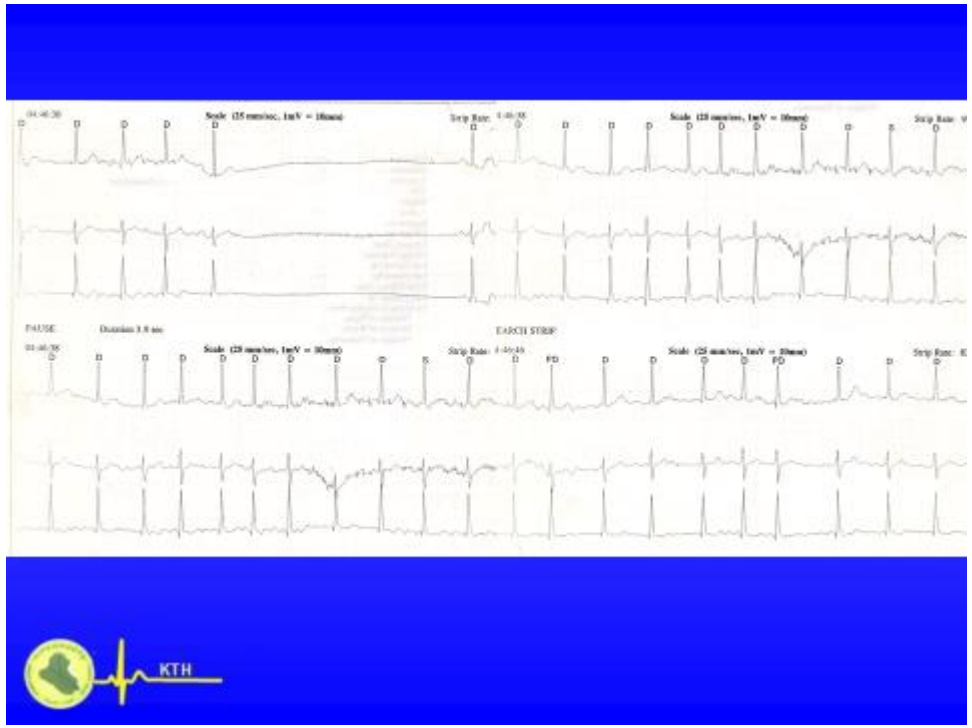
**Permanent pacemaker implantation is indicated for symptomatic sinus bradycardia that results from required drug therapy for medical conditions. (*Level of Evidence: C*) Class I

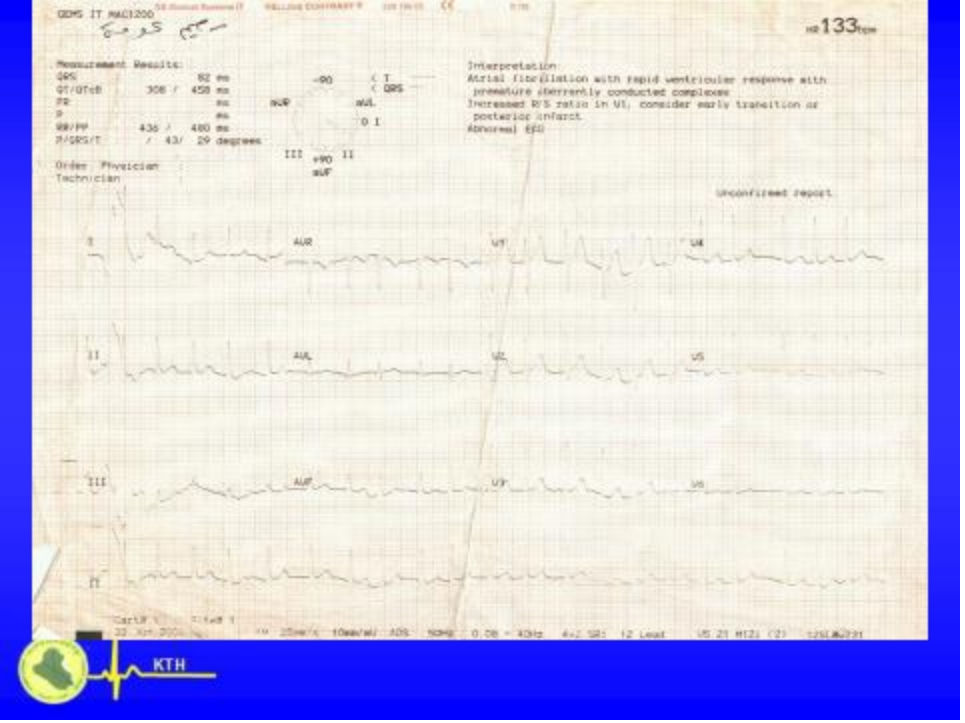
Dizzy spells ,pre syncope and syncope

- These are not common symptoms in HT
- Transient bradyarrhythmias should be looked for carefully

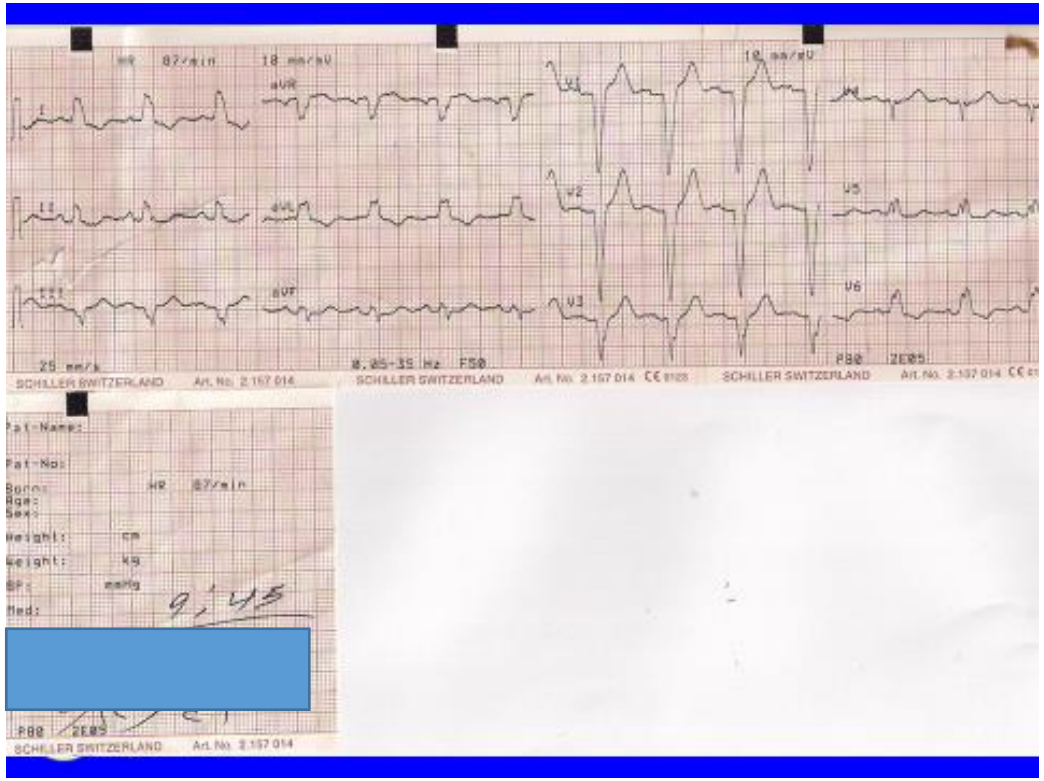


Old MI, HT , recurrent pre syncope

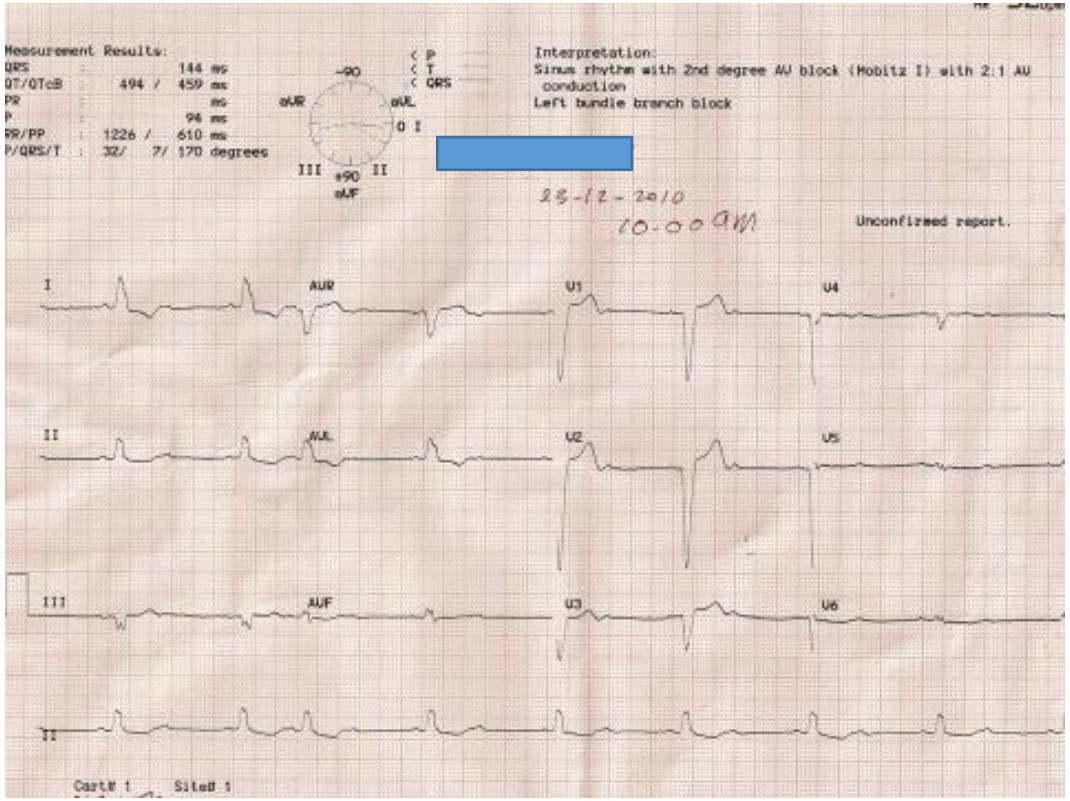




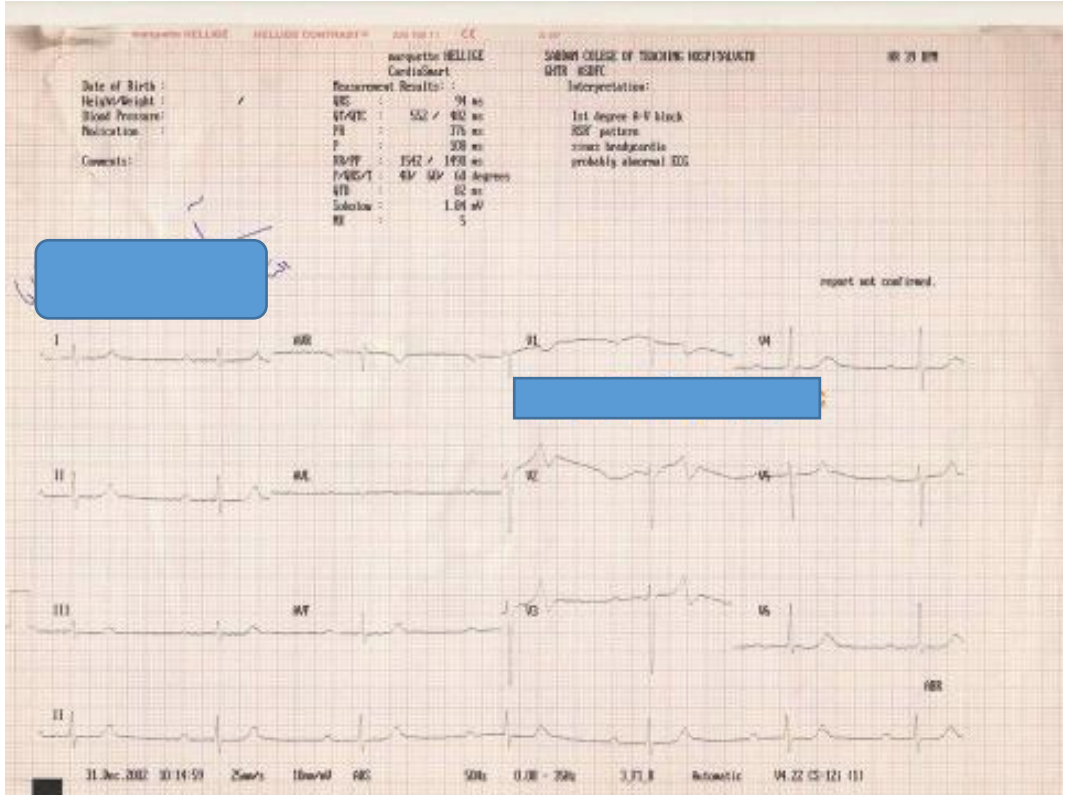
45 y man PAF, recurrent pre syncope, HT



65 y lady HT treated as so, recurrent dizzy spells



55 y Male ,HT treated for almost a year .BP180/70 with no control



BP 140/70

AAD and HT

- Beta blockers are the only antiarrhythmic drugs that have been demonstrated to reduce mortality in patients with VT

Modify your drugs therapy

- Dihydropyridines, like amlodipine, nicardipine, and nifedipine, are highly selective for calcium channels are primarily used to treat hypertension. On the other hand, non-dihydropyridines are the class IV antiarrhythmics and they include verapamil and diltiazem

Thank you