EMC 451

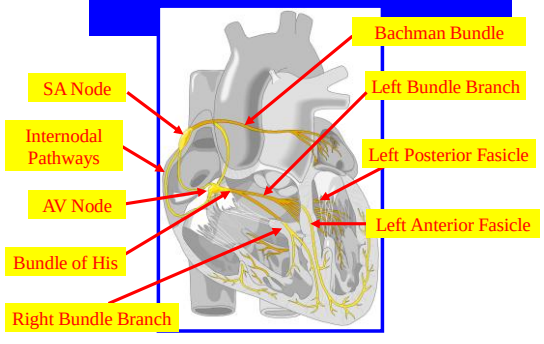
Advanced ECG Interpretation

Unit 6: Hemiblocks

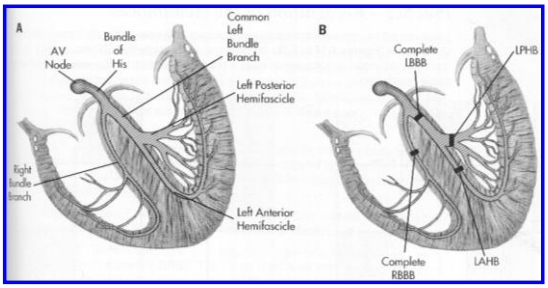
Unit Objectives

- Upon completion of this unit, you should be able to:
  - Describe the ventricular conduction system.
  - Identify a left anterior fascicular block using the 12 lead ECG.
  - Identify a left posterior fascicular block using the 12 lead ECG
  - Discuss the clinical significance of fascicular block.
  - Discuss the complexities of diagnosing AMI in the presence of fascicular block.

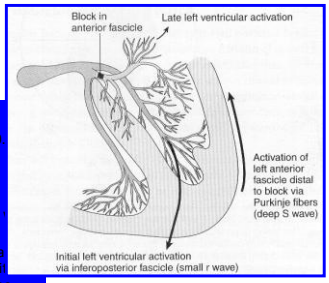
Electrical Conduction System



Electrical Conduction System

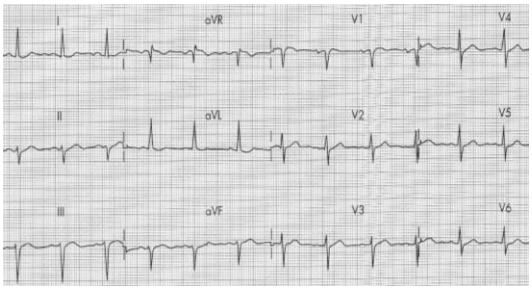


Left Anterior Hemiblock



- EKG Changes
  - QRS complex usually at 0.
    seconds
  - Left axis deviation of -40
    more
  - rS in leads II, III, and aVF,
    no terminal R wave
  - Small Q waves in leads I a
    aVL due to the shift of init
    forces inferiorly and to the
    right
  - A terminal r or R wave in aVR

Left Anterior Hemiblock



Causes of Left Anterior Hemiblock

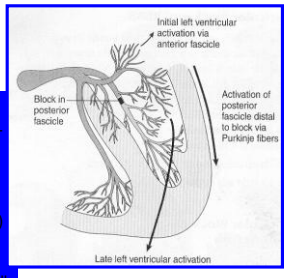
- Congenital
- Hypertensive heart disease
- Aortic valve disease
- Cardiomyopathy
- Arterial occlusion involving ventricular septum (LAD) with acute anterior MI
- Can occur in inferior wall MI
- Can be intermittent, rate related, or transient

Clinical Significance of Left Anterior Hemiblock

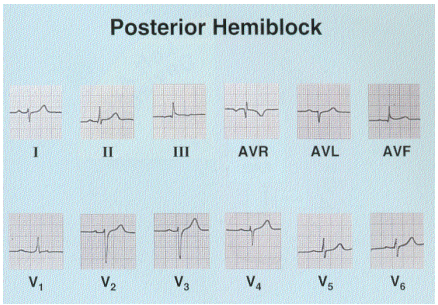
- Monitor closely for bifasicular block (RBBB and LAH). Also known as complete heart block.
- The vast majority of hemiblocks (98%) will be LAH because the LP fascicle has a dual blood supply.
- Of all the conduction defects associated with AMI, LAH carries the lowest mortality.

Left Posterior Hemiblock

- EKG Changes
  - Normal QRS duration and no ST segment or T wave changes
  - rS in lead I and aVL
  - qR in lead II, III, and aVF
  - Right axis deviation (120 -140)
  - No other causes or RAD are present (COPD, RVH, normal variant, emphysema, lateral wall infarction, pulmonary embolism)



Left Posterior Hemiblock



Clinical Significance of Left Posterior Hemiblock

- Because of the width and dual blood supply of the left posterior fascicle, isolated LPH is very rare.
- LPH has more serious clinical implications than LAH, since it implies compromise to both the right and left coronary arteries, as well as damage to large areas of myocardium, and to the electrical conduction system in the left ventricle.
- Incidence in the setting of AMI is 1.1%.
- It is almost always associated with RBBB, and carries a poor prognosis (71% mortality).

RBBB and Hemiblock

- RBBB and LAH
  - QRS > 0.12 seconds
  - Terminal complex of QRS is positive in lead V_1
  - Left axis deviation
  - No other causes for LAD
- RBBB and LPH
  - QRS > 0.12 seconds
  - Terminal complex of QRS is positive in lead V_1
  - Right axis deviation
  - No other causes for RAD