

From HIS to Ventricle: Normal & Abnormal Conduction

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The impulse that generated by the SA node conduct to AV node. Then, the impulse is conducted through bundle of His and divided the left and right bundle branch to the Purkinje fiber for each side of the heart. Left bundle branch is spitting into the left anterior fascicle and left posterior fascicle. Cardiac conduction abnormality can be occur at each conduction system due to various causes.

In Right bundle branch block(RBBB), activation of the right ventricle is delayed as depolarization has to spread across the septum from the left ventricle. Left ventricle is activated normally. ECG shows broad QRS>120ms, M-shaped pattern in V1-3 and wide, slurred S wave in the lateral leads(I, aVL, V5-6) because of delayed right ventricular activation

In Left bundle branch block(LBBB), impulse spread first to the RV via the right bundle branch and then to the LV via septum. ECG shows broad QRS>120ms, tall notched R waves in the lateral leads(I, aVL, V5, 6) and deep S waves in the right precordial leads(V1-3) because of direction of depolarization from right to left.

In left anterior fascicular block(LAFB), initial electrical vector is directed downwards and rightward, producing small R waves in the inferior lead (II, III, aVF) and small Q waves in the left sided leads(I, aVL). The major wave of depolarization then spreads in an upwards direction, producing tall R waves in the left sided leads and deep S waves in the inferior leads.

In left posterior fascicular block(LPFB), initial electrical vector is directed upwards and leftwards, producing small R wave in the lateral leads(I, aVL) and small Q waves in the inferior leads(II, III, aVF). The major wave of depolarization then spreads in an downwards and rightward direction, producing tall R waves in the inferior leads and deep S waves in the lateral leads.

Bifascicular block is the combination of RBBB with either LAFB or LPFB. Trifascicular block can be incomplete or complete, depending on whether all three fascicle have completely failed or not. Incomplete trifascicular block can be inferred from fixed bifascicular block with 1st or 2nd degree AV block or fixed RBBB with alternating LAFB/LPFB. Complete trifascicular block can be inferred from 3rd degree AV block with feature of bifascicular block.

Verapamil sensitive fascicular VT is most common form of idiopathic VT. The mechanism of this VT is reentry. The circuit is not completely defined but may comprise fascicular tissue and ventricular myocardium.