History of Preexcitation

"A Case in Which the Vagus Influenced the Form of the Ventricular Complex of the Electrocardiogram"

Introductory Note to a Classic Article by Frank N. Wilson, M.D.

The early part of the twentieth century was an exciting time in electrocardiography. Einthoven first described the use of the Ader string galvanometer to record the electrical impulses of the human heart in 1902. Sir Thomas Lewis studied many patients using an upgraded version of the Einthoven string galvanometer, and in 1911 Lewis described the electrocardiographic patterns of many arrhythmias. At about the same time, Carl Rothberger, an Austrian, recorded electrocardiographic conduction patterns following experimental sectioning of branches of the bundle of His in animals. The clinical description of bundle branch block patterns came somewhat later after correct association of left and right bundle branch block conduction disturbances were clarified by George Fahr and Frank Wilson.

Frank Wilson was aware of Rothberger's work on bundle branch block conduction disturbances when, in 1915, he published his now famous case report reprinted in the accompanying classic article entitled "A Case in which the Vagus Influenced the Form of the Ventricular Complex of the Electrocardiogram." In this classic article we see the first presentation of the combination of short PR interval (0.10 seconds) and a wide QRS complex associated with episodes of paroxysmal tachycardia. Wilson further described in this case report that the ventricular complexes were at times normal, and at other times had various conduction-pattern disturbances that could be induced by vagal stimulation and abolished by atropine.

Fifteen years later (1930), Louis Wolf, John Parkinson, and Paul White described a clinical syndrome in eleven patients with "the combination of bundle-branch block, abnormally short PR intervals, and paroxysms of tachycardia."¹ The authors attributed the unusual electrocardiographic pattern to vagal stimulation.

The concept of early excitation of the ventricle first surfaced in 1932 when the German physicians Max Holzmänn and David Scherf proposed an accelerated conduction mechanism to explain the electrocardiographic features of the syndrome described by Wolff, Parkinson, and White, now called the WPW syndrome. A year later, the American physicians, Charles Wolferth and Francis Wood, speculated that "an accessory pathway of auriculo-ventricular conduction" might permit retrograde conduction from the ventricle to the atrium, thereby permitting a reentrant tachycardia. They thought the bundle of Kent might be the substrate for the accessory pathway. This concept fit with the circus-reentrant mechanism proposed by George Mines two decades earlier. It was not until 1944 that the term preexcitation was coined by R. F. Ohnell for application to the WPW syndrome.

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REFERENCE

1. Wolf L, Parkinson J, White PD. Bundle-branch block with short P-R interval in healthy young people prone to paroxysmal tachycardia. *Am Heart J* 1930;5:685-704.