

Coumel P & Attuel P. Reciprocating tachycardia in overt and latent preexcitation: influence of functional bundle branch block on the rate of the tachycardia.
Eur. J. Cardiol. 1:423-36, 1974.
[Hôpital Lariboisière, Paris, France]

This paper deals with two original ways for diagnosing latent preexcitation in patients with paroxysmal junctional reciprocating tachycardias: the phenomenon of paradoxically premature atrial capture by ventricular stimulation, and the influence of functional bundle branch block on the tachycardia rate. [The SCI® indicates that this paper has been cited in over 115 publications since 1974, making it the most-cited paper ever published in this journal.]

Philippe Coumel
Department of Cardiology
Hôpital Lariboisière
75015 Paris
France

February 15, 1983

"My interest in preexcitation syndromes dates from the early days of clinical electrophysiology; this discipline started in the late-1960s. Several groups realized that stimulating the heart chambers was a fantastic tool for exploring the arrhythmias. The atrioventricular (AV) junction was the most fruitful area for verifying the long proposed concept of reentry, but attention was focused on proving the reciprocating mechanism rather than locating it. It was supposed to be extranodal every time a preexcitation pattern was present, and the reverse was taken for granted.

"Mendez and Moe¹ were the first to demonstrate experimentally the reality of reentry in the AV node, and actually it was only after reading their publication that we understood what we had done in our first explored patient.² Again, Moe and his group called attention, in 1971, to the probability of accessory pathways conducting only retrogradely.³ Precisely at that time it was also our impression, after having manipulated many junctional tachycardias, that they reacted identically whether or not the evidence of preexcitation was present. Progressively, just initiating and terminating tachycardias became less attractive than influencing their course: the yes or no

question was replaced by the how and why. Instead of measuring RR or PP' intervals, we started measuring the stimulation-P: shortening the cardiac cycle by more than the stimulus prematurity defined the paradoxically premature capture, which is sufficient to prove the existence of an extranodal circuit.

"The influence of the bundle branch block on the tachycardia rate is just an extension of this mode of reasoning. The time relationships between P' and R during reciprocating tachycardias were irrelevant in the classical conception of upper, middle, and lower nodal rhythms with initial and final common pathways, so that people working in this field were not paying enough attention to their variations. Measuring the retrograde conduction times during the capture phenomenon helped us to realize how meaningful the principles of goniometry were; and when these conduction times were disturbed in coincidence with the presence or absence of a bundle branch block, we were forced to realize that the only possible explanation was the route of the impulse. Once the principle was known, it could be extended to the other phenomena, most recently to the coupling interval of ventricular premature beats.⁴

"I think that this paper has been cited frequently because it is the first which deals directly with the problem of latent accessory pathways and proposes a diagnostic approach. Having a paper frequently or not frequently cited is a matter of chance, and language, rather than value: we published a more documented paper on this subject one year later,⁵ and it was almost completely ignored. Since that time, many studies have been devoted to the same problem. They mainly use the technique of atrial capture and its time and space relationships with the ventricular activation and ventriculo-atrial conduction, in addition to the atrial mapping.^{6,7} These different approaches to the geometry of the pathways have permitted extension of the notion of accessory routes not only to partial atrio-His or His-ventricle bundles, but also to accessory nodal formations, particularly in the permanent form of reciprocating tachycardia."^{2,8}

1. Mendez C & Moe G K. Demonstration of a dual AV nodal conduction in the isolated rabbit heart. *Circ. Res.* 19:378-93, 1966.
2. Coumel P, Cabrol C, Fabiato A, Gougon R & Slama R. Tachycardie permanente par rythme réciproque. I. Preuves du diagnostic par stimulation auriculaire et ventriculaire. *Arch. Mal. Coeur Vaisseaux* 60:1830-49, 1967.
3. De La Fuente D, Sasyniak B & Moe G K. Conduction through a narrow isthmus in isolated canine atrial tissue: a model of the W.P.W. syndrome. *Circulation* 44:803-9, 1971.
4. Bliak S A & Denes P. The effect of intermittent bundle branch block on the coupling interval of ventricular premature depolarizations. *Circulation* 66:1120-3, 1982.
5. Coumel P, Attuel P, Motte G, Slama R & Bouvrain Y. Les tachycardies jonctionnelles paroxystiques. Évaluation du point de jonction inférieur du circuit de rentrée. Démembrement des "rythmes réciproques intra-nodaux." *Arch. Mal. Coeur Vaisseaux* 68:1255-68, 1975.
[The SCI indicates that this paper has been cited in over 25 publications since 1975.]
6. Sellers T D, Jr., Gallagher J J, Cope G D, Tonkin A M & Wallace A G. Retrograde atrial preexcitation following ventricular premature beats during reciprocating tachycardia in the Wolf-Parkinson-White syndrome. *Eur. J. Cardiol.* 4:283-94, 1976.
7. Gallagher J J, Fréchet E L C, Benditt D G, Tonkin A M, Campbell R W F, Dugan F A, Bashore T M, Tower A & Wallace A G. New catheter techniques for analysis of the sequence of retrograde atrial activation in man. *Eur. J. Cardiol.* 6:1-14, 1977.
8. Gallagher J J & Sealy W C. The permanent form of junctional reciprocating tachycardia: further elucidation of the underlying mechanism. *Eur. J. Cardiol.* 8:413-30, 1978.