

Differentiation of wide QRS tachycardia: Garbage in, garbage out


Dear Editor,

We have read with interest the paper by Reddy et al. (2017) concerning Marriott's sign entitled "The exception to Marriot's (sic) sign" in the last issue of ANE. We believe that two aspects of this ECG case report deserve comment.

The authors argue and conclude that the presented wide QRS complex tachycardia (WCT) could be misdiagnosed as ventricular tachycardia (VT) due to the presence of the Marriott's sign in lead V_2 . We believe that this conclusion follows the classic cybernetic law "garbage in, garbage out" i.e., the quality of output is determined by the quality of the input. Marriott's sign should be assessed in lead V_1 only, not in lead V_2 . Neither Marriott, nor subsequent electrocardiographers that assessed or discussed/reviewed this sign ever mentioned application of the "taller left rabbit's ear" criterion to lead V_2 . We are not aware of any study that would provide specificity and/or sensitivity for such QRS pattern in lead V_2 . QRS complex in lead V_1 in the presented case is a rsR' complex—typical for supraventricular tachycardia with aberrancy, and such initial diagnosis in the current case should be made. We believe that the Marriott's sign criterion is not applicable to lead V_2 because QRS in lead V_2 not infrequently display such pattern during supraventricular tachycardia with aberrant conduction. Without much searching we have found several similar examples in our WCT database (Figure 1). The authors could also see a few ECGs with identical V_2 pattern during SVT in the Marriott's book that they cite (pages: 114, 116, 136) (Marriott, 2002).

Even if in the current case a *bona fide* Marriott's sign was present, i.e., a R or qR complex in lead V_1 that displays a double-peaked R with the amplitude of left peak higher than the right peak, the statements like "...illustrates an important exception to Marriot's sign..." or "...making Marriott's sign obsolete..." would be hard to accept. Marriott's sign is not 100% specific. Henry Marriott himself considered it only 90% specific—in his "Workshop in Electrocardiography" he provides a "reasonable approximation" that the "left rabbit ear taller than the right" sign favors VT vs SVT at 10:1 (Marriott, 1972). Perhaps that was a too modest approximation, as later studies showed higher specificity (albeit on small cohorts, for example there were only four cases with the Marriott's sign in the study by Wellens et al. and 14 cases in the study by Drew and Scheinman) (Drew & Scheinman, 1995; Wellens, Bar, & Lie, 1978). Occasional exceptions to the Marriott's sign should not be surprising and certainly do not make it "obsolete" as likely none of the ECG criteria is 100% specific

for the diagnosis of VT; at least, after analyzing 786 WCT cases we have found none (Jastrzebski et al., 2016). The only way to achieve or approach 100% specificity in VT diagnosis and to avoid misdiagnoses fueled by exceptions to single criteria is to look for the simultaneous presence of several VT specific features (an approach utilized in our "VT score" method where the Marriott's sign was incorporated into the "dominant R in V_1 criterion") (Jastrzebski et al., 2016). In the case presented by Reddy et al. not even one VT specific feature can be identified (VT score of 0) indicating a nondiagnostic ECG albeit with the odds of SVT: VT of approximately 5:1.

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REFERENCES

- Drew, B. J., & Scheinman, M. M. (1995). ECG criteria to distinguish between aberrantly conducted supraventricular tachycardia and ventricular tachycardia: Practical aspects for the immediate care setting. *Pacing and Clinical Electrophysiology*, 18, 2194–2208.
- Jastrzebski, M., Sasaki, K., Kukla, P., Fijorek, K., Stec, S., Czarnecka, D. (2016). The ventricular tachycardia score: A novel approach to electrocardiographic diagnosis of ventricular tachycardia. *Europace*, 18, 578–584.
- Marriott, H. (1972). *Workshop in electrocardiography*. Oldsmar, FL: Tampa Tracings.
- Marriott, H. (2002). *Challenging ECGs*. Philadelphia, PA: Hanley & Belfus.
- Reddy, V., Kundumadam, S., Kathi, P., Dhilon, K., Ismail, H., Anem, G. (2017). The exception to Marriot's sign. *Annals of Noninvasive Electrocardiology*, e12449. <https://doi.org/10.1111/anec.12449>
- Wellens, H. J., Bar, F. W., & Lie, K. I. (1978). The value of the electrocardiogram in the differential diagnosis of a tachycardia with a widened QRS complex. *American Journal of Medicine*, 64, 27–33.



FIGURE 1 Pseudo Marriott's sign in lead V₂ during supraventricular tachycardias with aberrant conduction. (a and c) atrioventricular nodal reentrant tachycardia, (b and d) atrial flutter