

His bundle capture proximal to the site of bundle branch block: A novel pitfall of the para-Hisian pacing maneuver

Marek Jastrzebski, MD, PhD,* Piotr Kukla, MD, PhD,[†] Danuta Czarnecka, MD, PhD*

From the *First Department of Cardiology, Interventional Electrophysiology and Hypertension, Jagiellonian University, College of Medicine, Cracow, Poland, and [†]Department of Cardiology, H. Klimontowicz Specialistic Hospital, Gorlice, Poland.

Introduction

The para-Hisian pacing maneuver is useful in determining whether retrograde conduction is dependent on atrioventricular (AV) nodal conduction. Loss of direct His bundle capture results in a longer route for the depolarization wave to reach the AV node and the atrium, as it has to travel through the working myocardium to engage the distal Purkinje fibers. Thus, loss of direct His bundle capture results in obligatory ventriculoatrial (VA) interval prolongation unless a nonphysiological retrograde conduction route (an accessory pathway [AP]) is present. Consequently, a stable VA interval with loss of His bundle capture is considered diagnostic of the presence of an AP. This concept has been regarded as useful, especially when concentric retrograde atrial activation is present.¹ Subsequently, however, potential important pitfalls in the interpretation of this differentiating maneuver were described. These include the recognition of inadvertent atrial capture, pure His bundle capture, the presence of fasciculoventricular pathways, and the impact of retrograde dual AV nodal physiology.^{2–5}

Case report

A 14-year-old boy presented with recurrent syncope and preexcitation on the surface electrocardiogram. An electrophysiology study was performed under general anesthesia. The AP conducted intermittently in the basal state, unmasking incomplete right bundle branch. After administration of isoprenaline, however, the AP was capable of 1:1 conduction at a cycle length of 240 ms. The fully preexcited QRS morphology observed indicated localization in the left posterior region. The anterograde Wenckebach point was reached at 230 ms, with conduction only via His-Purkinje system at this rate, along with normal atrium-His and His-ventricle intervals and

KEY TEACHING POINTS

- Care should be taken in interpreting the results of para-Hisian pacing maneuvers in patients with preexisting, functional or even transient, mechanically induced bundle branch block. In such cases, proximal His bundle capture with sudden QRS prolongation mimics complete loss of His bundle capture and might lead to misinterpretation of the response as extranodal.
- Paced QRS morphology should be assessed to differentiate between complete loss of His bundle capture and loss of distal His bundle capture alone. This might be enough in patients with proximal right bundle branch block; however, in patients with proximal left bundle branch block, QRS morphology might be similar with loss of His bundle capture and with proximal His bundle capture.
- A further reduction in pacing output or pushing the pacing catheter slightly deeper into the right ventricle to ensure pure right ventricular myocardial capture may be useful to avoid misinterpretation of proximal His bundle capture as pure right ventricular myocardial capture.
- This pitfall may be avoided by recording retrograde His potential with a second catheter to confirm the loss of direct His bundle capture rather than relying on the usual observation of sudden QRS prolongation with the decrease in pacing output.

KEYWORDS Accessory pathway; Bundle branch block; His bundle; Para-Hisian pacing
(Heart Rhythm Case Reports 2017; ■:1–4)

This work was supported by the Jagiellonian University (grant no. K/ZDS/006433). **Address reprint requests and correspondence:** Dr Marek Jastrzebski, First Department of Cardiology, Interventional Electrophysiology and Hypertension, University Hospital, ul. Kopernika 17, 31-501 Cracow, Poland. E-mail address: mcjastrz@cyf-kr.edu.pl.

right bundle branch block. Retrograde conduction was decremental with 1:1 conduction up to a cycle length of 240 ms and was mildly eccentric, with earliest atrial activation just after coronary sinus ostium, corresponding to the presumed AP localization. Despite isoprenaline infusion, no arrhythmia was induced. Para-Hisian pacing was performed to determine whether the AP conducted in a retrograde manner. The decrease



Figure 1 The decrease in pacing output was accompanied by QRS complex prolongation, suggestive of loss of His bundle capture. However, there was no corresponding prolongation of the ventriculoatrial (VA) interval, indicating an extranodal response. CS1 to CS5 represent proximal to distal coronary sinus electrodes.

in pacing output resulted in a sudden QRS complex prolongation, but there was no corresponding change in the retrograde atrial activation sequence or in the VA interval of 85 ms

(Figure 1). Such a response to para-Hisian pacing is considered indicative of retrograde conduction via an AP. However, in the present case this was a variant of the nodal response.



Figure 2 Para-Hisian pacing with increase in pacing output. The first 2 QRS complexes of left bundle branch block morphology result from pure right ventricular myocardial capture. Subsequent narrower QRS complexes of right bundle branch block morphology represent His bundle capture proximal to the site of block in the right bundle. Narrowing of the QRS complex with His bundle capture corresponds to shortening of the ventriculoatrial (VA) interval from 128 to 85 ms. CS1 to CS5 represent proximal to distal coronary sinus electrodes.

Download English Version:

<https://daneshyari.com/en/article/8660540>

Download Persian Version:

<https://daneshyari.com/article/8660540>

[Daneshyari.com](https://daneshyari.com)