Correspondence

Response by Rivarola and Scanavacca to Letter Regarding Article, "Targets and End Points in Cardiac Autonomic Denervation Procedures"

In Response:

We would like to thank Dr Debruyne for his interest in our article Targets and End Points in Cardiac Autonomic Denervation Procedures[1] and for bringing in some important topics on this technique. Based on his observations,[2] Dr Debruyne proposes that:

- The procedure must be limited to the right side of the interatrial septum, and the anterior right ganglionated plexus should be considered the main target.
- The procedure must be tailored and the ablation lesion kept to a minimum.
- The P-P interval measurement should be considered a procedural end point.
- A solely anatomic approach is preferred.

Whereas agreement among authors is often reached about some aspects of the denervation technique[1–3] (such as the anatomic approach, the use of electrophysiological intervals shortening as end points, and the identification of the interatrial septum as a main target), other aspects are still controversial. The extent of radiofrequency ablation needed to produce clinical benefit and still avoid potential complications is one of the most important and controversial issues. The ability to tailor ablation to individuals is even more difficult when one considers the complexity of the morphology, distribution, and variability of the epicardial neural ganglionated plexi and their highly variable divisions and overlapping network of fibers. These topological characteristics prevent us from assuming that a focused targeted ablation will invariably solve the problem and that a final common pathway of vagal innervation can always be identified in every patient.

Although Dr Debruyne[2] was able to identify the anterior right ganglionated plexus as a sole critical spot in his case report, this might not be effective in a larger population. Furthermore, the choice of a multielectrode irrigated catheter for ablation makes clear that ablation over an area, rather than a focus, is desired. In our study, we report a success rate of 71% after a combined left and right septum approach. Whereas extensive ablation[3] proposed by some authors aims at better results at the potential expense of higher risks, ablation restricted to only right-sided lesions[2] might be less effective, particularly with long follow-up.

What is the perfect combination of boldness and caution when it comes to denervation procedures? A randomized study might answer that question. Meanwhile, there are some clinical and experimental evidences that can guide us:

- Most epicardial ganglia are located on the posterior surfaces of both atria.[4]
- Both pulmonary vein ganglia and superior vena cava ganglia stimulation have been demonstrated to modulate sinoatrial node activation in experimental models, implying the presence of both left and right vagal pathways to that node.[4]
- During denervation, critical sites triggering significant shortening of the P-P and HV intervals could be located either in the left or right side of the interatrial septum.[1]

In conclusion, we agree that ablation over extensive areas should be avoided. However, the complex neural anatomy raises concern as to the efficacy of targeting a single region for ablation. A multicenter randomized study is needed to determine the best technique.

Disclosures

None.

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References

1. Rivarola EW, Hachul D, Wu T, Pisani C, Hardy C, Raimundi F, Melo S, Darrieux F, Scanavacca M. Targets and end points in cardiac autonomic denervation procedures. *Circ Arrhythm Electrophysiol*. 2017;10:e004638. doi: 10.1161/CIRCEP.116.004638.
2. Debruyne P. "Cardio-neuromodulation" with a multielectrode irrigated catheter: a potential new approach for patients with cardio-inhibitory syncope. *J Cardiovasc Electrophysiol*. 2016;27:1110–1113. doi: 10.1111/jce.13031.
3. Pachon M JC, Pachon M EI, Santillana P TG, Lobo TJ, Pachon CTC, Pachon M JC, Albornoz V RN. Simplified method for vagal effect evaluation in cardiac ablation and electrophysiological procedures. *JACC Clin Electrophysiol*. 2015;1:451–460. doi.org/10.1016/j.jacep.2015.06.008.
4. Ripplinger CM, Noujaim SF, Linz D. The nervous heart. *Prog Biophys Mol Biol*. 2016;120:199–209. doi: 10.1016/j.pbiomolbio.2015.12.015.

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