

## Para-Hisian Atrial Tachycardia and Atrioventricular Nodal Reentry Tachycardia: After 25 Years The Same History?

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Short Editorial related to the article: Catheter Ablation of Focal Atrial Tachycardia with Early Activation Close to the His-Bundle from the Non Coronary Aortic Cusp

The recent history of the para-hisian atrial tachycardia (PHAT) looks a lot like the older history of the atrioventricular (AV) nodal reentry tachycardia (AVNRT). The debate about precise anatomic boundaries of AV nodal reentry continues today again in the AVNRT,<sup>1</sup> even 75 odd years after the first suspect that some mechanisms of supraventricular tachycardia could involve the region of the AV node.<sup>2</sup> In this type of arrhythmia, the first target for the catheter ablative therapy was the fast pathway of the AV node:<sup>3</sup> this approach showed a high success rate, but induction of AV block was found in more than one every five patients.<sup>4</sup> After a few years, an approach was proposed from the slow pathway,<sup>5</sup> that proved to be more effective and safer than the approach from the fast pathway.<sup>4</sup> For some years, this new approach generated some debate in the electrophysiology (EP) community. Some authors even suggested to cross over from one technique to the other as long as AVNRT persisted.<sup>6</sup> Nowadays, the approach from fast pathway is definitely abandoned and when we think of catheter ablation of AVNRT, we think only about ablation of the slow pathway.

PHAT are a group of atrial tachycardia (ATs) originating near the His-bundle (HB) region. Their prevalence is quite high in some casuistries,<sup>7</sup> therefore it is important learning to recognize and to treat them. Nowadays, in the same manner of AVNRT, also for PHAT a debate is present for both the anatomic site of origin of this type of arrhythmia,<sup>8</sup> both about the mechanism,<sup>9,10</sup> both about the best catheter ablation approach.<sup>11-14</sup> Some authors hypothesized the presence of

a small re-entrant circuit adjacent to the tricuspid annulus;<sup>10</sup> in contrast, other authors described PHAT as focal ATs arising from various location around the tricuspid or mitral annuli.<sup>9</sup> PHAT are amenable to catheter ablation from multiple approaches including right inter-atrial septum, left inter-atrial septum by a transeptal puncture and non coronary sinus (NCS) of Valsalva of the aortic root by a transaortic approach via the femoral artery.

In this issue of *Arquivos Brasileiros de Cardiologia*, Chokr et al.<sup>15</sup> importantly, describe a case-series of patients ablated from the NCS of Valsalva. One of the most relevant findings of their work is the fact the this type of ablation is feasible with a relatively low radiological exposure also without a 3-D electroanatomic mapping system and without the intracardiac echocardiography, of which the current EP community seems to be unable to do without. For this reason, this method can be feasible in every EP lab. However, even if it was already proved that an ablative approach from the NCS of Valsalva is more effective and safer than an approach from the HB region in the right and/or left inter-atrial septum,<sup>12,14</sup> regardless of the earliest atrial activation site, there are authors that in some situations suggest as first choice the ablation of the right or left inter-atrial septum,<sup>11,13</sup> despite the risk of creating damages to the AV conduction system. Probably, as in AVNRT history, in another 25 years, when we will think about PHAT ablation, we will think only about the NCS of Valsalva approach, and the approach from the HB region will be definitely forgotten!

### Keywords

Non Coronary Sinus of Valsalva; Atrial Tachycardia; Atrioventricular Nodal Reentry Tachycardia

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### References

1. Bagliani G, Leonelli FM, De Ponti R, Padeletti L. Advanced concepts of atrioventricular nodal electrophysiology: Observations on the mechanisms of atrioventricular nodal reciprocating tachycardias. *Card Electrophysiol Clin*. 2018 Jun;10(2):277-97.
2. Barker PS, Wilson FN, Johnston FD. The mechanism of auricular paroxysmal tachycardia. *Am Heart J*. 1943; 26(4):435-45.
3. Haissaguerre M, Warin J, Lemetayer P, Saoudi N, Guillemin JP, Blanchot P. Closed-chest ablation of retrograde conduction in patients with atrioventricular nodal reentrant tachycardia. *N Engl J Med*. 1989; 320(7):426-33.
4. Jazayeri MR, Hempe SL, Sra JS, Dhala AA, Blanck Z, Deshpande SS, et al. Selective transcatheter ablation of the fast and slow pathways using radiofrequency energy in patients with atrioventricular nodal reentrant tachycardia. *Circulation*. 1992; 85(4):1318-28.
5. Jackman WM, Beckman KJ, McClelland JH, Wang X, Friday KJ, Roman CA, et al. Treatment of supraventricular tachycardia due to atrioventricular nodal reentry, by radiofrequency catheter ablation of slow-pathway conduction. *N Engl J Med*. 1992; 327(5):313-8.
6. Langberg JJ, Leon A, Borganelli M, Kalbfleisch SJ, el-Atassi R, Calkins H, et al. A randomized, prospective comparison of anterior and posterior approaches to radiofrequency catheter ablation of atrioventricular nodal reentry tachycardia. *Circulation*. 1993; 87(5):1551-6.
7. Toniolo M, Rebellato L, Poli S, Daleffe E, Proclemer A. Efficacy and safety of catheter ablation of atrial tachycardia through a direct approach from noncoronary sinus of Valsalva. *Am J Cardiol*. 2016; 118(12):1847-54.
8. Bohora S, Lokhandwala Y, Sternick EB, Anderson RH, Wellens HJ. Reappraisal and new observations on atrial tachycardia ablated from the non-coronary aortic sinus of Valsalva: authors' reply. *Europace*. 2018;20(1):214-5.
9. Iwai S, Bedhwar N, Markovitz SM, Stambler BS, Keung E, Lee RJ, et al. Electrophysiologic properties of para-Hisian atrial tachycardia. *Heart Rhythm*. 2011; 8(8):1245-53.
10. Yamabe H, Okumura K, Morihisa K, Koyama J, Kanazawa H, Hoshiyama T, et al. Demonstration of anatomical reentrant tachycardia circuit in verapamil-sensitive atrial tachycardia originating from the vicinity of the atrioventricular node. *Heart Rhythm*. 2012; 9(9):1475-83.
11. Madaffari A, Grosse A, Bruneli M, Frommhold M, Dahne T, Oreto G, et al. Electrocardiographic and electrophysiological characteristics of atrial tachycardia with early activation close to the His-Bundle. *J Cardiovasc Electrophysiol*. 2016; 27(2):175-82.
12. Lyan E, Toniolo M, Tsyganov A, Rebellato L, Proclemer A, Manfrin M, et al. Comparison of strategies for catheter ablation of focal atrial tachycardia originating near His bundle region. *Heart Rhythm*. 2017;14(7):998-1005.
13. Yang JD, Sun Q, Guo XC, Zhou GB, Liu X, Luo B, et al. Focal atrial tachycardias from the parahisian region: Strategies for mapping and catheter ablation. *Heart Rhythm*. 2017;14(9):1344-50.
14. Bohora S, Lokhandwala Y, Sternick EB, Anderson RH, Wellens HJ. Reappraisal and new observations on atrial tachycardia ablated from the non-coronary aortic sinus of Valsalva. *Europace*. 2018;20(1):124-33.
15. Chokr M, Moura LG, Sousa IBS, Pisani CF, Hardy CA, Melo SL, et al. Ablação por Cateter de Taquicardia Atrial Focal com Ativação Precoce Próxima ao Feixe de His, a Partir da Cúspide Aórtica não Coronária. *Arq Bras Cardiol*. 2021; 116(1):119-126.

