Typical atrial flutter. What's new?

Tipik atriyal flutter. Yeni olan nedir?

In the current issue of the Anatolian Journal of Cardiology, the study by Erdem et al. (1) aims at determining the area of slow conduction in typical (counterclockwise) and reverse typical (clockwise) atrial flutter (AF). For this, they cleverly used the isochronal maps as retrieved from the electro-anatomical system to investigate the conduction velocities and the conducting areas-i.e. surface of the areas activated at the same time-all around the tricuspid annulus. They conclude that conduction is slowing at the lower septal right atrium, while conducting areas are larger in the upper right atrium (in other words the conduction is faster in these areas) for both typical and reverse typical AF.

As mentioned by the authors in the discussion, the slow conducting area-what is usually called the "isthmus" of a reentry circuit, even if this term originally refers to a protected path of the circuit rather than to conduction velocities-has been located at the cavo-tricuspid isthmus (CTI) or at the low septum during AF in most previous studies. This is easily explained by the complex muscular arrangement of the CTI and areas covering the coronary sinus ostium, with interlacing trabeculae stemming from the right atrial pectinate muscles, prominent Eustachian ridge or sub-Eustachian recesses or pouches, all this leading to non-uniform anisotropic conduction (2-4). Conversely, conduction is faster at the other parts of the tricuspid annulus, possibly due to the continuous subepicardial circumferential layer (which is less developed in the septal region) and due to the discontinuous subendocardial perpendicular myofibers (which are lacking in the anterior region) (5).

The authors claims that the technique used in this study is probably more reliable for determining conduction velocities, being less dependent on lead orientation and allowing averaging of otherwise heterogeneous local activation times. Even if probably true, maybe explaining the differences in absolute conduction velocities with previous works, this did not lead to a dramatical change in the location of the areas of slow conduction, since their findings do not contradict most of the previous reached conclusions.

In which aspects the present findings are original? Most if not all of the referenced works cited by the authors conclude that the area of slowest conduction during AF was more or less located at the CTI. In that aspect, no new data was given by this work, except maybe that the septal side of the CTI is more slowly conducting than the lateral one, although this had already been reported before [see discussion and references in the current paper (1).

A more original result is the comparison the authors made between the areas of slow conduction during typical and reverse typical AF. They do not find any difference between both AF, septal CTI being the slowest area shared by both reentry circuits. However, left to right conduction through the CTI has been said to be slower than conduction over the reverse direction (6), possibly due to the non-uniform anisotropy. However, studies comparing CTI conduction during counterclockwise and clockwise AF are rare, and the results presented here are in accordance with the only one reported before (7). Since clockwise AF and counterclockwise AF occurring in a same patient display similar atrial rate (8), an additional interesting analysis would have been to compare the conduction velocities at the CTI between typical and reverse typical AF on the same patient basis, but this data was not available here.

More than forty years after the first-and almost complete-delineation of AF circuit, more than twenty years after the advent of radio-frequency ablation for AF, it is fortunate that such clinical investigations still happen, proving the remaining interest of some electrophysiologists for the understanding of the precise location and electrophysiological characteristics of AF circuits, which were however believed to be fully known at least at first look. For example, delineation of the upper turns around or determinations of the excitable gap during typical AF are recent examples of clinical investigations in this area (9, 10). This apparently "simple" and "well-known" arrhythmia keeps on providing intriguing studies, while definitive cure of AF by CTI ablation is currently easily performed by so many centers with a very good long-term efficiency and without further interrogations about "where it slows" or "where it goes through".

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