


eComment. “Electric” Cox-maze IV with bipolar radiofrequency: toward full transmurality

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I read with great interest the article by Chen et al. [1]. Despite the results shown by several studies collected in this review by the authors, several special circumstances surrounding this controversy should be emphasized. Unfortunately, the main problem of the unipolar radiofrequency (RF) ablation is that it produces lesions without any reliable way to determine transmurality. As a result, partial-thickness ablation can frequently occur. Several studies indicate the superiority of bipolar RF ablation when compared with unipolar RF ablation in causing transmural lesions. Bipolar RF ablation effectiveness is nearly 100% in producing permanent transmural linear lesions [2, 3]. A feedback mechanism involving the impedance plateau of the tissue between two apposing electrodes in the jaws of the bipolar clamp for RF is used to assure lesion transmurality [4]. The unipolar RF source releases hot energy, but it cannot just be confined entirely to the myocardial tissue. Indeed, this can cause collateral damage to extracardiac structures [5]. While the bipolar RF limits the burn to the width of the clamp, the unipolar pencil produces a burn several millimetres wider. Personally, I have seen unipolar RF burns up to 7-8 mm in width. Furthermore, the possibility of perforation of the left atrial wall is always present. Both conditions are the result of a lack of standardization beyond the control by the surgeon. Thus, there is an apparent trend towards the implementation of the Cox-maze IV, also known as the “electric” Cox-maze, through the application of the bipolar RF clamp on a pattern of biatrial lesions. Cryolesions or cut-and-suture should be performed in the mitral and cavo-tricuspid isthmuses to assure the elimination of all possible routes of AF reentry.

In conclusion, I would recommend caution with the use of unipolar RF. At the same time, I would advise the routine use of bipolar RF clamp on a pattern of biatrial lesions, accompanied by cryoablation or cut-and-suture in specific areas, which can not be safely reached by the bipolar clamp. In my opinion, unipolar RF ablation is destined to become obsolete in the near future.

References