Reply to Tannous et al.

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We thank Tannous et al. [1] for their valuable comments on our review [2]. We agree that pacemaker implantation is an important complication of surgical ablation of atrial fibrillation (AF). As we cited, a recent systematic review on minimally invasive radiofrequency ablation of AF found a rate of pacemaker implantation of 1.4%, which was considerably lower than the 6.9% presented by Tannous et al. and other authors [3]. This difference is likely related to the setting of AF ablation (lone intervention versus concomitant surgery, respectively). Indeed, a recent retrospective analysis of the predictors and risk of pacemaker implantation after the Cox-Maze procedure found concomitant procedures to be associated with a non-significantly higher risk than lone interventions (15 vs 6%, P = 0.060, at 1 year). Age was the single independent predictor of pacemaker implantation [4]. In concomitant AF ablation, associated cardiac diseases and procedures might influence the pacemaker implantation rate by inducing conduction or sinus-node disturbances.

In our experience of concomitant AF ablation, pacemaker implantation was the most common complication. Nearly 15% of the patients (n = 170) required definitive pacemaker implantation following radiofrequency ablation (unpublished data). Patients undergoing bi-atrial ablation procedures had a significantly higher risk of postoperative pacemaker implantation (P < 0.001), which was in line with prior reports [3, 5]. Worku et al. compared several energy modalities and lesion sets, and suggested that microwave energy and right atrial ablation lines increased risk of post-procedural pacemaker implantation. Their findings were recently corroborated by Pecha et al., who identified bi-atrial ablation as the single independent predictor of pacemaker implantation. This is though not consensual as Kim et al. [6] suggested that bi-atrial cryoaablation reduced AF recurrence without increasing post-operative complications, namely pacemaker implantation, when compared with procedures restricted to the left atrium. Pacemaker implantation was required only for a minor fraction of patients undergoing bi-atrial procedures (1.8%). Of note, Pecha et al. [3] found cryoablation to be associated with a marginally lower rate of pacemaker implantation in comparison with radiofrequency energy.

In conclusion, pacemaker implantation is recognized as one of the main complications of AF ablation. Concomitant procedures and bi-atrial lesion sets seem to increase this risk, but further evidence on the independent predictors is eagerly warranted.

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REFERENCES