Conflict of interest: none declared.

REFERENCES


eComment. Bipolar radiofrequency ablation for atrial fibrillation during concomitant cardiac surgery

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Structural heart disease is very often accompanied by atrial fibrillation (AF) and can worsen the patient’s condition perioperatively by haemodynamic inadequacy and low cardiac output. Since its introduction in 1987 by James Cox, the surgical maze procedure became a “gold standard” in terms of restoration of sinus rhythm. Efforts to reduce surgical risk brought about new approaches to the problem with the use of different types of energy to perform transmural and linear lesions in the atria. Bipolar radiofrequency ablation is most effective in this respect according to data in the literature [1]. Within the period May 2010 to May 2012, 63 patients with concomitant heart pathology underwent bipolar radiofrequency ablation using the AtriCure system (West Chester, OH, USA) due to persistent or long-standing persistent AF. Besides AF, other pathologies were treated: three left atrial myxomas, 12 mitral valve annuloplasties, 41 mitral valve replacements, and seven aortic valve replacements. In all 63 cases, the maze IV procedure was performed without significant influence on intervention and cross-clamping times (mean time of additional surgical ablation was 18 ± 3 minutes). During the acute period after surgery, no major surgical complications were observed. Two patients (3%) required dual-chamber pacemaker implantation because of sick sinus syndrome. All patients received amiodarone, if tolerated, or sotalol perioperatively and after discharge as the main anti-arrhythmic drug. The postablative atrial tachycardia (PAAT) rate was assessed using repetitive 4-hour Holter monitoring at 3 (after blanking period), 6, 12, and 24 months respectively. Paroxysm was considered significant if lasting more than 30 seconds. At 2-year follow up, most recurrences of PAAT were observed from 6 to 12 months after surgery (14±6%), from 12 to 24 months we observed a 12% recurrence rate. Basi et al. [1] include a strong statement arising from their meta-analysis that bipolar RFA is highly successful in restoring sinus rhythm and, as a result, improving heart failure [2]. There is also clear evidence that additional surgical ablation does not significantly affect postoperative morbidity and mortality and has an advantage in terms of transmurality and cost-effectiveness versus unipolar ablation and other sources of energy [3]. According to our data, bipolar RFA has a short learning curve, is simple to use in the operating theatre and is effective. It can be used in any case of concomitant heart surgery. In some cases, such as isolated AF refractory to antiarrhythmic drugs and multiple percutaneous attempts, bipolar RFA can also be recommended to patients through thoracotomy or thoracoscopy.

Conflict of interest: none declared

References


[16] I read with interest the article by Basu et al [1]. There is no doubt that bipolar radiofrequency (RF) ablation is better than unipolar RF ablation to cure the atrial fibrillation (AF) because of the full transmurality achieved almost exclusively by the bipolar RF. I have discussed this matter previously [2,3]. The presumed basis of successful AF ablation is production of myocardial lesions that block the propagation of AF wave fronts from a rapidly firing triggering source or modification of the arrhythmogenic substrate responsible for re-entry. Successful ablation depends upon achieving lesions that are reliably transmural. The hypothetical scenario with the patient described by Basu et al [1] corresponds to a Class IIa indication with supporting evidence graded as level C for concomitant surgical ablation of AF, and after discharge as the main anti-arrhythmic drug. The postablative atrial tachycardia (PAAT) rate was assessed using repetitive 4-hour Holter monitoring at 3 (after blanking period), 6, 12, and 24 months respectively. Paroxysm was considered significant if lasting more than 30 seconds. At 2-year follow up, most recurrences of PAAT were observed from 6 to 12 months after surgery (14±6%), from 12 to 24 months we observed a 12% recurrence rate. Basi et al. [1] include a strong statement arising from their meta-analysis that bipolar RFA is highly successful in restoring sinus rhythm and, as a result, improving heart failure [2]. There is also clear evidence that additional surgical ablation does not significantly affect postoperative morbidity and mortality and has an advantage in terms of transmurality and cost-effectiveness versus unipolar ablation and other sources of energy [3]. According to our data, bipolar RFA has a short learning curve, is simple to use in the operating theatre and is effective. It can be used in any case of concomitant heart surgery. In some cases, such as isolated AF refractory to antiarrhythmic drugs and multiple percutaneous attempts, bipolar RFA can also be recommended to patients through thoracotomy or thoracoscopy.

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procedure, when properly performed in a standard “cut-and-sew” fashion, cures AF in nearly 100% of the patients with or without concomitant disease [5]. However, the long aortic clamp times have always been the hallmark of this procedure. Simplification of the maze procedure has evolved toward newer streamlined surgical approaches using different ablation tools. Irrigated bipolar RF ablation seems to be the more effective to reach to goal. Nevertheless, the success rate of curing AF remains limited. In fact, until now there is no paper in the literature demonstrating an effectiveness of 100% with the electric Cox-maze IV procedure. Finally, we should keep in mind that in the real world the Cox-maze III “cut-and-sew” standard procedure is reserved only to a select number of cardiac surgeons because of its high surgical complexity.

In conclusion, I think that bipolar RF ablation is better than unipolar RF ablation in treating AF. Procedures that are more complete than simple PV isolation such as the electric Cox-maze IV with bipolar RF ablation must be performed. If the case is treated within an experienced and referral centre, the Cox-maze III “cut-and-sew” is the standard procedure of choice to eliminate AF.

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References