Intraoperatively, you confirmed entrance and exit block of the PVs; however, three months after, when patients got touched up, only 66% had isolated pulmonary veins. What is your explanation for that?

Dr Kurfirst: Yes. I think that during our surgical procedure, when you are testing the transmurality of the lesion, you are testing it by the decline of impedance of the clamps. And also, it has been shown that clamping of pulmonary veins alone, without any energy, has the potential for provoking some kind of exit or entry block for a while, maybe for some hours. So I think that especially in dilated left atria with fibrous tissue, we need more lesions. So these are our results from the beginning of this programme, and I hope that with adding more lesions, we can also increase the success rate of PV isolation.

Dr Salzberg: We do a single hybrid approach in Amsterdam, and we clamp the PVs until the impedance drops within 5 seconds, and then we do epicardial entrance and exit block testing. And I was just wondering why these lesions weren't complete over time.

My second question, more importantly, concerns the left atrial appendage. You were able to exclude 66% of left atrial appendages, which in my opinion is not enough. Because when the patient comes to surgery, we are not sure if we are going to be able to treat the rhythm properly, but we can at least get rid of that appendage. Why only 66% success rate for this?

Dr Kurfirst: Yes you are completely right; this has something to do with the learning curve of our procedure. So in the beginning, in the first 10 patients, it was maybe about 40 or 50% of patients. And at this time, it is more than 90%. So I think that with the learning curve, we will also be more successful in this.

Dr Salzberg: I think the previous speaker, with the talk on the stapler, showed the importance that we surgeons learn that we have different tools to be able to deal with different types of anatomy. I don't think that one size fits all, and that's why having more options available (as do the cardiologists in Europe with the Watchman and the Amplatzer and the LARIAT) I think will help us.

Dr S. Benussi *(Milan, Italy)*: I have only one more question. Sasha talked about the 60%, nearly 70% success rate on isolation of the pulmonary veins. I really don't understand why you would pursue a trigone line which in your experience has achieved a successful ablation in only one case. So why do that at all? The EP cardiologists like to do that line in totally another place, not where you suggest they do so. You're probably just creating some scars, which are quite likely the cause of post-ablation tachycardia, like the one you experienced in your series.

Dr Kurfirst: You are totally right. The issue is that in our protocol, we only had the partial isthmus line, because it was as a favour by our EPs that they wanted to help with this mitral isthmus line. So it was in a protocol that we go to only part of it, and they will do the rest. So they don't have to do a 7 cm lesion, but only a 3 or a 2.

Dr T. Hanke *(Lübeck, Germany)*: As I understand it from an anatomical standpoint, the trigone line is different than the EP's mitral isthmus line, right?

Dr Kurfirst: Yes.

Dr Hanke: It goes from the left pulmonary vein down through the mitral, and it is P1, and the trigone line goes to A1. So do you call this finalization?

Dr Kurfirst: We call it finalization.

Dr Benussi: You are actually right about the second mitral line.

Dr Kurfirst: So that's my mistake. Sorry.

Dr N. Ad *(Falls Church, VA, USA)*: I have two comments. One is that we have to remember that ablation lines that are being applied across the Bachmann bundle as a part of the Dallas lesion set are very hard to establish as the atria are very thick there. It is basically a very similar line to the maze I which was abandoned because it created a block and a significant delay between the activation of the right and left atrium. So you may end up with an 180 to 280 millisecond delay between the right and left atrium. I don't understand this line at all.

Secondly, we all have to go back to the original mapping of human atria and remember that the isthmus line across the coronary sinus is necessary not only to abolish atypical atrial fibrillation, but also because AF can originate around the coronary sinus. But I believe that the main issue here is not the heart team concept and the collaboration; it is about the fact that we surgeons don't have reliable tools to ablate epicardially on a beating heart and create reliable transmural lesions.

So in our institute, the biggest opponents of the hybrid procedures are the EPs. And we have a hybrid EP suite, an operating room that is equipped like an EP Lab where we can do everything. Why is that? Because we see time after time that all those lines that look okay during the operation are not okay and create a lot of arrhythmias, both new and recurrent.

So as a stage to a good hybrid procedure that makes sense; it is not about the lesion, it is about the devices. And currently, except for the bipolar clamp to the pulmonary veins, nothing really works, and Stefano can say more about it than I can say; we have no device that can transmit reliable transmural lesions epicardially.

So we can do a fancy minimally invasive procedure and basically throw away all our essential work that is actually good for the patients. The procedure shouldn't be done so the patient can drink coffee in the afternoon; the procedure should be done so the patient can drink coffee ten years from now, A Fib free. This is our challenge as surgeons.

eComment. Genuine hybrid or convergent treatment of atrial fibrillation. What should we choose?

Authors: ***Leo A. Bockeria, Andrey Filatov and Alexey Kovalev***
Bakoulev Heart Institute, Moscow, Russia
doi: 10.1093/icvts/ivu057

Treatment for persistent atrial fibrillation (AF) includes different strategies for surgical and interventional procedures; nevertheless there are still no unified guidelines. The subject is associated with many controversies from anamnesis to follow-up. Thus, every clinic selects its own way. In this article the authors describe their experience with a "two-stage" hybrid treatment of AF. The results are very optimistic, statistics are provided, but the report still leaves more questions than answers [1]. First of all there is the selected strategy: two steps in treatment can be precluded by lack of funding, major complications or the absence of a hybrid OR. Although every patient requires an individual approach, there are more advantages in a one-step technique such as exact confirmation of transmurality of ablation lines and absence of endo-epicardial gaps. In addition, it reduces time of fluoroscopy and total procedure time.

The second question is follow-up. It is recognized that even 7-day Holter monitoring cannot provide objective information about sinus rhythm maintenance over the entire post-procedural period. Despite the popularity of this diagnostic method, continuous monitoring with an implanted loop recorder is preferred [2]. It is associated with a large number of asymptomatic paroxysmal events, especially in patients with non-paroxysmal AF. This condition may lead to inappropriate cancellation of anti-arrhythmic therapy and oral anticoagulant therapy and the return of AF or stroke as a consequence.

As previously mentioned, the results are optimistic. The data provided by the authors is in line with earlier reports on these methods with a mean total percentage of 90% of patients in sinus rhythm at 1-year follow-up [3]. The main problem is that the proper treatment of all forms of AF gives approximately 90-95% of success in the first year which progressively declines in subsequent years in patients with non-paroxysmal AF. Unfortunately there are still no big trials on the efficacy of hybrid treatment in long-term follow-up in order to confirm or refute this experience. Yet the two-step strategy brings one undeniable advantage. Inflammatory processes in ablation points become less with time. It allows the definition of boundaries of non-isolated substrate and target points. In conclusion, we recognize some benefits of a two-stage hybrid approach as one of the treatment modalities, but a definitive solution should take into account data from multicentre randomized trials.

Conflict of interest: none declared

References

[1] Kurfirst V, Mokracek A, Bulava A, Canadyova J, Hanis J, Pesl L. Two-staged hybrid treatment of persistent atrial fibrillation: short-term single-centre results. Interact CardioVasc Thorac Surg 2014;18:451–56.
[2] Zembala M, Filipiak K, Kowalski O, Boidol J, Sokal A, Lenarczyk R *et al*. Minimally invasive hybrid ablation procedure for the treatment of persistent atrial fibrillation: one year results. Kardiol Pol 2012;70:819–28.
[3] Pison L, La Meir M, van Opstal J, Blaauw Y, Maessen J, Crijns HJ. Hybrid thoracoscopic surgical and transvenous catheter ablation of atrial fibrillation. JACC 2012;60:54–61.