EDITORIAL

THE PROS AND CONS OF INVESTING IN ARRHYTHMIA SURGERY:FUTURE IMPLICATIONS

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In a (surgical) minute ,
everything can change...
D.Henley

On May 28, 1968, Sealy and associates accomplished the first successful surgical division of a Kent bundle in a fisherman with incessant reentrant atrioventricular tachycardia[1]. This opened the era of surgical management of cardiac dysrhythmias, which gained widespread clinical interest throughout the world over the succeeding two decades. The introduction of programmed stimulation and Holter monitoring yielded growing knowledge of the mechanisms responsible for various forms of cardiac dysrhythmias, amongst which, Wolf-Parkinson-White (WPW) syndrome, A-V junctional reentry, nodoventricular fiber tachycardias, atrial fibrillation, and several different types of ventricular tachyarrhythmias became amenable to surgical therapy in turn[2-10].

By far, the most frequently performed surgical procedure for arrhythmia control is the division of accessory pathways, either with an epicardial or an endocardial approach[6].The excellent success, safety, and reproducibility of surgical interruption of accessory atrioventricular connections in WPW syndrome have led to the extension of indications for surgery, from life threatening arrhythmias refractory to medical treatment, to any patient requiring treatment at all, or even to asymptomatic cases in certain situations[10]. Surgery for WPW syndrome is advantageous for young patient who would otherwise require lifelong antiarrhythmic therapy with potential complications[11]. More advantages of surgery over medical therapy can be considered, such as reversibility of tachycardia-induced cardiomyopathy after surgical cure of incessant supraventricular tachycardia, and a more favourable cost-benefit ratio achieved by surgical management of symptomatic patients[12,13]. Excellent surgical results have been reported and recurrences or complications are an exception with the current methodology employed[6,14,15].

Surgical treatment of ventricular tachycardias with or without coronary artery disease is another major division of arrhythmia surgery.

As early as 1968, indirect means of arrhythmia control was attempted by localizing infarction and ischemia of the myocardium by intraoperative mapping which guided a Vineberg procedure[16]. Direct myocardial revascularization or blind aneurysmectomy was also performed with the same purpose[17]. The advent of sophisticated electrophysiologic testing techniques established that the arrhythmogenic site responsible for ventricular tachycardia is the ischemic border zone, and that the entire border zone was actually or potentially arrhythmogenic[18-20]. This had led to direct attempts to remove or exclude the arrhythmogenic zone, such as encircled endocardial ventriculotomy and endocardial resection[21,22]. The first report of direct arrhythmia surgery in Türkiye was a successful encircled endocardial ventriculotomy, performed on January 12, 1983[23]. Regarding surgery for ventricular tachycardia, relatively high mortality and morbidity rates can be anticipated in surgery for WPW syndrome due to the nature of the disease. Nonetheless, this kind of surgery is reported to be of significant benefit to patients suffering from ventricular tachycardia [7,24].

On February 4, 1980, Mirowski and associates performed the first automatic defibrillator implantation[25]. During the past several years, the efficacy of the automatic implantable cardioverter defibrillator (AICD) in preventing sudden cardiac death has been clearly demonstrated, and surgical AICD implantation has become a widely utilized procedure, even in the community hospitals, and sometimes deemed as an alternative to endocardial resection in poor-risk surgical candidates[26-29]. The cost effectiveness of the AICD is reported to be in the acceptable range for a life-saving intervention and less expensive than pharmacologic therapy[30].

The above mentioned considerations clearly indicate that, surgical interventions for arrhythmia control have a definitive role in the overall scheme of current cardiac arrhythmia therapy. However, as this therapeutic modality is not yet available in Türkiye, a "gap" exists in our surgical practice. The current level of cardiac surgery, which is applied at high standarts both qualitatively and quantitatively in at least ten centers throughout Türkiye, necessitates the fullfillment of this "gap".

Once put in this way, the problem that rises may be selection of a system, training, setting up and getting started. On the other hand, one may also consider the role of arrhythmia surgery in the future, or rather, does arrhythmia surgery has a future? Although arrhythmia surgery can be performed without the use of sophisticated and expensive apparatus[31], such modest experience will likely not be the case in Türkiye, and this investment will be an expensive one. With this point in mind, one should revisit some recent developements and refinements in invasive electrophysiology.

Interruption of accessory pathways and AICD implatation, which form the majority of arrhythmia surgery practice, will likely be performed in the electrophysiology laboratory in the near future[32-41].

Several reports indicate that, electrical and radio frequency ablation of accessory atrioventricular pathways is quite successfull, and will likely be a strong alternative to surgical intervention[23-35]. Mahaim fibers can also be effectively ablated in the catheterization laboratory[36].

Although electrical ablation of posteroseptal pathways is reported to be of limited efficacy with a high risk morbidity[37], it still appears to be promising in this highly demanding localization[32,38]. Transcoronary chemical ablation of the AV node is another promising way of dealing with patients who present uncontrollable ventricular rates in atrial fibrillation[39]. A report from University of Michigan highlightened another advantage of catheter ablation over surgery: low cost and less time lost from work by the former approach[38].

Like catheter ablation of accessory pathways, AICD implantations also will probably be performed in the catheterization laboratory, owing to the recent developments in intracardiac defibrillation electrodes and AICD technology[40-42]. With these improvements AICD implantation will be like routine transvenous pacemaker implantation.

Ventricular tachycardias are also amenable to catheter fulguration, but the recent ingenious transcoronary chemical ablation of such tachycardias will likely be the treatment of choice in the forthcoming days[39,43]. In this procedure, a coronary tributary supplying the area responsible from the arrhythmia is selectively catheter-

ized and cold saline injected. Cessation of the arrhythmia confirms the success, and ethyl alcohol is injected to cure the arrhythmia permanently. Another potential method for life-threatening ventricular arrhyhmias is endocardial laser coagulation. Although this procedure is currently experimental, available data suggest it will be in the clinical practice in the near future[44,45].

It appears that the only cardiac arrhythmia to be left to the surgeons hands will be one of most prevalent of all arrhythmias : atrial fibrillation. Recently developed atrial maze procedure provides definitive cure with most favourable hemodynamic consequences, and as for today has no medical or catheter ablative alternatives[8,9].

The intention of this editorial is to present a perspective, without a detailed discussion. Koşuyolu Heart Journal would like to open a platform, on which cardiac surgeons and cardiologists are encouraged to comment on.

Currently arrhythmia surgery plays a certain and important role as a therapeutic modality; but what role will it have in the future? This question should be properly answered before making an investment decision in a sophisticated arrhythmia surgery facility.

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